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PHOTOGRAMMETRY OF THE PARTICLE TRAJECTORIES ON DIPOLE WEST SHOTS 8, 9, 10, AND 11

Volume IV—Shot 11

University of Victoria
British Columbia
Canada V8W 2Y2

March 1978

Final Report for Period 1 January 1978—31 February 1978

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Volume 4 of this report describes the photogrammetry and analysis of the particle trajectories in blast waves produced by the simultaneous detonation of two spherical 1080-lb (490-kg) Pentolite charges (DIPOLE WEST Shot 11). One of the charges was positioned at a height of 25 feet (7.6 m) above smooth ground, and the second charge 50 feet (15.2 m) above the first. Photogrammetrical measurements were made of the trajectories of air particle flow tracers (smoke puffs) which had been placed in a vertical grid at heights → over

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20. ABSTRACT (Continued)

ranging from 3 ~~feet~~ (0.92 m) to 58 feet (17.7 m) above the ground and at radial distances ranging from 25 ~~feet~~ (7.6 m) to 140 feet (42.7 m) from the vertical axis through the charges. From the measured particle trajectories, calculations were made of the particle velocities, densities, hydrostatic overpressures, dynamic pressures, and total pressures throughout the blast wave, at times ranging from 3 ms to 110 ms after detonation of the charges. The shock front times-of-arrival were also determined from the photogrammetrical measurements for the primary shock from each of the two charges, for the Mach stems produced above and below the interaction plane midway between the two charges, and for the Mach stem produced at the ground surface. From the shock front times-of-arrival, calculations were made of the shock velocities and, in turn, the peak particle velocities, air densities and hydrostatic overpressure immediately behind each shock. Calculations were also made of the variation with time of the particle velocity, density, hydrostatic overpressure, dynamic pressure, and total pressure at several fixed points. Results, presented both graphically and in tables, are compared to results previously calculated for the same experiment using shock front photogrammetry (Dewey, et al, 1975) and to measurements of side-on and total pressure obtained by electronic transducers (Keefer and Reisler, 1975). The analytical procedures used were similar to those described in Volume 1 (Dewey, et al, 1977).

SUMMARY

Owing to the quantity of material to be presented, this report is divided into several volumes. Volume 1 introduced the series, described the analytical procedures in detail, and presented and discussed the results for Shot 10. Volumes 2 and 3 presented and discussed the results for Shots 9 and 8. This volume presents and discusses the results for Shot 11. A subsequent volume will compare the results of the four experiments. The method of analysis is common to all four experiments and is described in detail in Volume 1 only.

So that the results from the four experiments may be easily compared, they have been scaled to remove the effects of varying atmospheric conditions. (Results are scaled to a 1 kg charge weight and a standard atmosphere of dry air at 15°C at sea level.) For the most part, only scaled results are presented. Exceptions include some derived pressure-time histories, which are compared to actual gauge measurements made in the experiment.

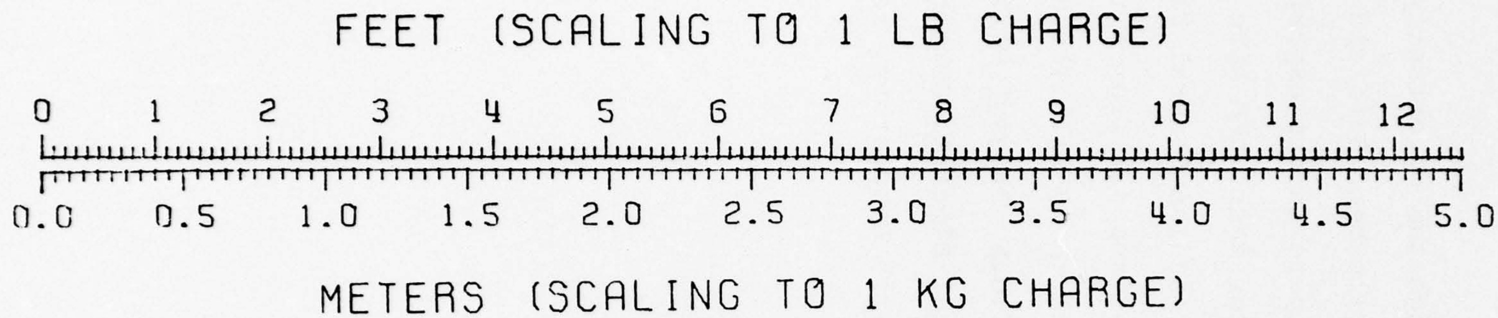
Results are presented in SI units, even though the experiments were originally laid out in British units. Only distance and time measurements are affected, however, as velocity, density, and pressure results are presented as dimensionless ratios. A distance units conversion scale is included to convert between SI units (meters scaled to a 1 kg charge) and British units (feet scaled to a 1 lb charge),

plus a time scale factor and scale factors to convert pressure ratios to both British and SI pressure units. Scale factors which may be used to compute the distance and time values actually observed under the ambient conditions of each shot are also provided. Dimensional pressure units are used for the results presented at gauge locations.

PREFACE

The authors gratefully acknowledge the opportunity offered by the Defence Research Establishment Suffield and the Defence Nuclear Agency to participate in the experiments described in this report. The analyses described here were carried out under contract with the Canadian General Electric Company, and with additional financial support from a research grant by the National Research Council (A 2952). The advice and assistance of Mr. A.P. Lambert, C.G.E. Project Officer at DRES, Dr. L. Kennedy, of the General Electric Company, and Mr. J. Keefer, of the Ballistic Research Laboratory, is also gratefully acknowledged.

Unit conversion and scaling factors



For feet scaled to a 1000 lb charge, multiply the top scale by 10.

For time scaled to a 1000 lb charge, multiply time scaled to a 1 kg charge by 8.683.

For pressure in kPa, multiply a pressure ratio (in atmospheres) by 101.325. For pressure in psi, multiply the pressure ratio by 14.696. To convert kPa to psi, divide by 6.895.

To obtain distance values actually observed for Shot 11, in meters, multiply scaled values in this report by 8.0730. To obtain the observed distance values in feet, multiply the reported scaled values by 26.485. To obtain observed time values, multiply scaled time values by 8.5933. For observed pressures in kPa, multiply by 94.34; for observed pressures in psi, multiply by 13.683.

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continued....

LIST OF FIGURES (Continued)

footnote

To assist in the comparison between volumes, similar figures have been numbered identically. For this reason, figure numbers 9, 10 and 11 are not used in this volume.

LIST OF TABLES

footnote

To assist in the comparison between volumes, similar tables have been numbered identically. For this reason table number 6 is not used in this volume.

CHAPTER 1, SHOT 11 ANALYSIS

1.1 Introduction

This is the fourth volume in a series which presents the particle trajectory analysis results from four experiments (Dipole West Shots 8, 9, 10 and 11) carried out to obtain information on the interaction of spherical blast waves with real and ideal reflecting surfaces. A general description of the project can be found in Volume 1. The results presented in this volume are for Shot 11.

In each experiment, photogrammetrical studies were made of the shock fronts (refractive image analysis, RIA), and of the motions of smoke puff particle tracers (particle trajectory analysis, PTA). The refractive image analysis results were reported by Dewey et al. (1975) and results of the particle trajectory analysis are presented in this report. The method of particle trajectory analysis, common to all four shots is described in detail in Volume 1 only.

1.2 Description of Shot 11

Dipole West Shot 11 was fired on November 8th, 1973 by the Ballistics Research Laboratories at the Defence Research Establishment Suffield, in Alberta, Canada. Two 1080 lb (490 kg) spheres of Pentolite were detonated simultaneously, to within 5 microseconds, at nominal charge heights of 25 and 75ft (7.6 and 22.9m) over a relatively rough ground surface.

Particle trajectory data were gathered by photographing the movement of smoke puffs formed in a vertical plane running out from ground zero at 6.7° south of west. A WF5 camera operating at about 3500 frames per second was positioned 30ft (9.2m) above ground level at a position 600ft (183m) due south of ground zero (GZ), the point on the ground vertically beneath the charges.

Table 1 gives the field survey data for the event, and Figure 1 shows a plan view of the layout. The dashed line represents the approximate line of sight of the WF5 camera. Figure 2 shows the field of view of this camera.

The smoke puff grid was made up of 20 columns of 12 puffs each, hung vertically on strings. The vertical spacing of puffs was 5ft, beginning 3ft above ground level and ending at a height of 58ft. The horizontal spacing of the columns of puffs was 10, 7 or 5ft, depending on the distance from ground zero, beginning at about 25ft and ending at about 140ft from GZ. Of the possible 240 smoke puffs, 232 detonated successfully. A good film record was obtained, except that several of the white smoke puffs in the bottom row could not be very easily distinguished against the background of snow-covered, ploughed earth.

This report describes the analysis of the smoke puff data collected for Shot 11, and presents and discusses some of the results of that analysis.

1.3 Camera calibration and data reduction

The calculated camera position coordinates and orientation angles for Shot 11 are presented in Table 2, together with the positions of photomarkers transformed from one frame of the film just before detonation to an object plane defined as passing through ground zero and being normal to the camera orientation axis. The differences ("shifts") between the object plane positions of the transformed calibration points and their positions computed from the field survey data are given in Table 2. The object plane positions of the calibration points computed in these two ways are also shown in Figure 3.

The camera calibration procedure, described in detail in Volume 1, ensured that selected photomarker images (P1 to P5) transformed to the object plane in a way which matched them exactly to the positions computed using the survey data. These reference photomarkers for Shot 11 are indicated in Figure 3 using large circles: namely, P1 = W1, P2 = W3, and P3 = 300W1. The separation distance between P4 = P3 = 300W1 and P5 = 300W2 was also used as a calibration parameter. The probable reason for the shifts seen for photomarkers VP1A and VP1B was discussed in Volume 1.

The image positions of two reference photomarkers (VP3B and 300W2) and all smoke puffs were measured frame-by-frame over a time interval corresponding to the approximate

duration of the positive phase of the blast waves (film frames 10 to 375), and were transformed to distances in the object plane by matching the reference marker positions to their positions transformed from the calibration frame. These data were again transformed from the object plane to the smoke puff plane which was assumed to pass through "corrected" ground zero; to be vertical, and to run 6.7° south of west from GZ.

The x-y coordinate system in the smoke puff plane was the same for Shot 11 as for the other shots, except that the corrected value for ground zero was displaced 0.7ft from the surveyed ground zero, in a direction approximately 34° south of west. The corrected ground zero was defined to have the same elevation as the surveyed ground zero, but was located directly under the midway point between the two charge centers. As for the other shots, all data in the output plane are plotted with the x coordinate reflected, i.e. with positive values of x to the right hand side, as if the smoke grid had run to the right of the charges rather than to the left as seen in the film images.

A time was assigned to each film frame using the 1 ms timing marks placed on the film during its exposure. The film timing method was described in Volume 1, and the complete set of film timing data used for Shot 11 is provided in Table 3.

Figure 4 shows the positions of the detonated smoke puffs at a time prior to the detonation of the two charges. These

positions are in the plane of the charges and the smoke puff grid, as described above. The smoke puff plane was not exactly parallel to the camera image and object planes (Figures 2 and 3), and various geometrical corrections were applied to make the transformation between them. The puffs enclosed in parenthesis were not visible in the earlier film frames because they were concealed by the photomarkers, but were seen later. The puffs which are underlined in the figure were seen in their initial positions only - no trajectory data could be obtained. Charge positions in the figures are plotted as if they were positioned exactly above the corrected ground zero origin. The data shown in Figure 4 have not been scaled.

1.4 Data scaling and trajectory fitting

The position-time histories of individual smoke puffs were extracted from the frame-by-frame positions of the smoke puff grid, and then scaled to standard atmospheric conditions and charge weight. A change to SI units was made at this point in the analysis. The resulting trajectories were edited, and then smoothed by fitting polynomial functions.

Particle trajectory data were scaled by dividing all distances by Sachs scaling factor $S = \sqrt[3]{(WP_o)/(W_oP)}$ and multiplying all times by the factor $C/(C_oS)$, where C is the ambient sound speed computed for Shot 11. Data used to compute

C and S, and define the scaled event, are listed below with the computed values of C and S.

Ambient temperature,	$T = -19.11\ ^{\circ}C$	($-2.4\ ^{\circ}F$)
Ambient pressure,	$P = 94.34$ kPa	(13.683 PSI)
Relative humidity,	$RH = 60.0\%$	
Computed vapour pressure,	$VP = 0.08$ kPa	(0.6 mm Hg)
Ambient sound speed	$C = 319.689$ m/s	(1049 ft/s)
Charge weight,	$W = 489.9$ kg	(1080 lbs)
Sachs scaling factor	$S = 8.0730$	
Standard charge weight,	$W_o = 1.0$ kg	(2.2 lbs)
Standard pressure,	$P_o = 101.325$ kPa	(14.7 PSI)
Standard temperature,	$T_o = 15\ ^{\circ}C$	($59\ ^{\circ}F$)
Standard sound speed, (dry air)	$C_o = 340.292$ m/s	(1116 ft/s)

The results presented in this report therefore apply to a scaled event which is the detonation of two 1 kg charges in a standard atmosphere. The scaled heights of burst for Shot 11 were 0.905 m and 2.797 m, and the scaled charge separation divided by two, was 0.946 m.

Figure 5 shows the scaled particle trajectory data for Shot 11 in the smoke puff plane with positions measured horizontally and vertically from corrected ground zero. Approximately 27,247 puff positions are represented. As represented, the raw trajectory data have not been smoothed.

The raw particle trajectory data were edited to remove obvious data processing errors, such as a single point widely

displaced from its trajectory for one or two frames. The trajectory of each puff in turn was then smoothed by least squares fitting simple polynomial expressions separately to both the x and y coordinate data, these being discrete functions of frame time. The adequacy of each fit was determined by examining on the same graphical output, plots of both the raw trajectory data and the fitted curve. For Shot 11 this meant examining and adjusting 464 such plots, at least two or three times each.

For a given puff, the first step in fitting the raw trajectory data was to set the time of arrival of the shock front first hitting the puff. The data at subsequent times were fitted with polynomial functions, as described in Volume 1, paragraph 2.5. The first derivatives of the fitted functions were also calculated at a series of times for use in later calculations of particle velocity.

1.5 Regionalization and shock strength calculations

Five regions were defined in the smoke puff plane on the basis of the shock front which first struck the puffs in a particular region. These are shown in Figure 6. The regions were bounded by the triple point trajectories measured using refractive image analysis (Dewey et al., 1975). Regions 1 and 2 are those in which the smoke puffs were first hit by a spherical primary shock front, and regions 3, 4, and 5 are those in which the puffs were first hit by a

Mach stem.

In each of the five regions, the shock trajectory data obtained from the first movement of the smoke puffs were fitted to a function of the form

$$r(t) = A + Bt + C \log (1 + t) + D\sqrt{\log (1 + t)} ,$$

where r is the shock radius, t is the time after detonation, and A, B, C and D are the fitted coefficients. The shock velocities were calculated by differentiating this function. The peak particle velocity, V_s , peak density, D_s , and peak hydrostatic overpressure, P_s , as functions of shock radius in each of the five regions, were calculated from the shock velocity using extensions of the Rankine-Hugoniot equation. Details of the shock radius calculations etc. are described in Volume 1, paragraph 2.6.

1.6 Particle velocity calculations

Particle velocities were computed using the methods described in Volume 1, paragraph 2.7.

1.7 Density and hydrostatic overpressure calculations

Densities and hydrostatic overpressures in the smoke puff plane were calculated by the method described in Volume 1, paragraph 2.8. Results in both cases represent average values over cells defined by four adjacent smoke puffs.

1.8 Surface representation

Surfaces were fitted to the times of shock front arrival and to the fields of particle velocity, density and hydrostatic overpressure at a sequence of times. All data were interpolated onto a common regular Euleurian grid. Fields of dynamic pressure were computed from surface-interpolated particle velocity and density results. Contour plots were generated for all surfaces at selected times, and time histories computed at several fixed locations. The methods used were identical to those described for Shot 10 in Volume 1, Chapter 3.

1.9 Pressure and total pressure time-histories

To permit a direct comparison between results obtained from the particle trajectory analysis and measurements made using side-on and face-on pressure transducers, the hydrostatic and total overpressure time-histories were calculated at those locations coincident with gauge positions within the smoke puff grid. Dynamic pressures and hydrostatic overpressures obtained from the particle trajectory analysis were used to compute the total pressures after application of a compressibility correction. This correction is a function of the local Mach number and its form depends on whether the Mach number was greater or less than unity. The time varying hydrostatic and total overpressure impulses, determined by integrating the pressure time histories, were also calculated

and compared with similar integrations of the electronic transducer data.

The methods used to calculate the total pressures and the impulses are described in detail in the addendum to Volumes 1 and 2, which is incorporated in Volume 3. In cases where the leading edge of a time-history curve was rounded, impulse integrations were done using data interpolated linearly between the peak parameter value determined at the time of arrival, and a point on the time-history curve subsequent to the time of arrival. The second of these two points was chosen in a manner which ensured a minimum difference in slope between the interpolated and computed sections of the time-history data.

CHAPTER 2. SHOT 11 RESULTS

2.1 Times of shock front arrival

The measured initial puff positions, the times of first shock arrival, and the peak particle velocities obtained by differentiating the functions fitted to the particle trajectories are presented in Table 4. Puff position is given relative to corrected ground zero as origin, with horizontal and vertical axes. Puff position and the time of arrival of the first shock are given both as observed and scaled. Particle velocities listed are derivatives of the fitted puff trajectories at the times of shock arrival, and are expressed in Mach units. Expressed this way, the particle velocities are the same scaled as unscaled. Also listed are the initial radial puff positions (scaled) and region codes.

Shock front data determined from the first movement of the smoke puffs, i.e. calculated from the time-of-arrival data in Table 4, are listed in Tables 5.1 - 5.5. Each table corresponds to one of the 5 regions used. Listed are the observed and fitted unscaled shock trajectory data, the scaled fitted shock trajectory data, and the computed shock velocities and peak parameters associated with shock strength: peak hydrostatic overpressure in atmospheres and kilopascals, peak

particle velocities in Mach units, and peak density ratios. Given as ratios, these peak parameters are the same scaled as unscaled. Pressure given in kilopascals in the tables refers to the unscaled (observed) case only.

The shock front radius versus time data derived using particle trajectory analysis (PTA) are also shown in Figures 7.1 - 7.3 for the two primary fronts, the two Mach stems at the interaction plane, and the ground Mach stem, respectively. They are compared to corresponding data derived from refractive image analysis (RIA) reported by Dewey et al. (1975). The refractive image analysis results were obtained using photogrammetry against a striped canvas backdrop and they describe the shock as it travelled in a direction almost diametrically opposite to the direction of the smoke puff grid.

2.2 Shock strengths

Peak particle velocities calculated from shock front velocities are shown in Figures 8.1 - 8.3 for the primary fronts, interaction Mach stems, and the ground Mach stem. This method of determining peak particle velocities was labelled method 1, and the data plotted correspond to those listed in Tables 5.1 - 5.5. The results in the figures are compared with those previously obtained using refractive image analysis (RIA). In the case of the primary shock fronts, results are also compared to those of Brode (1957) for TNT.

In Volume 1 other methods of determining shock strengths in the various regions were described. It was demonstrated that method 1 was clearly the most accurate, and in the present volume shock strengths calculated using methods 2 and 3 are not reported. For this reason Figures 9, 10 and 11 and Table 6 do not appear in this volume.

2.3 Particle velocity fields

The calculated particle velocities in the plane of the smoke puffs are shown as vectors in Figures 12.1 through 12.8, for various times after the detonation. All times and positions are scaled to a 1 kg charge in a standard atmosphere. The particle velocity vectors represent the derivatives of the smoothed particle trajectories, and their magnitudes may be judged using the standard vector shown on each figure. All velocities are measured in Mach units, relative to the standard sound speed. Puffs not yet struck by a shock wave are represented by small circles (zero velocity).

Numerical data corresponding to Figures 12.1 - 12.8 are listed in Tables 7.1 through 7.11, along with scaled radial positions of the puffs, and region codes as defined in Figure 6. Conversion factors are given at the foot of each table, which may be used to convert the scaled data in the tables and figures back to their original unscaled values.

2.4 Density and hydrostatic overpressure fields

Calculated average relative densities throughout the smoke puff plane are depicted graphically in Figures 13.1 - 13.4, for various times after the detonation. All time values are scaled. Cell positions are scaled and are given relative to the corrected ground zero as origin with horizontal and vertical axes. The calculated densities may be judged using the density shading scale shown on each figure. Density is given as a ratio, relative to ambient density. Cells not yet struck by a shock wave and cells in which the density has dropped to a value less than ambient density are shown blank.

Corresponding numerical data are listed in Tables 8.1 - 8.8 along with radial cell positions computed according to the regions defined previously. Numerical data describing the fields of hydrostatic overpressure are similarly listed in Tables 9.1 - 9.8. The pressure results for a given cell were obtained by multiplying the density results for that cell by a factor determined by the strength of the shock which first traversed the cell and which then remained constant, i.e. by assuming isentropic flow after the first shock.

2.5 Times-of-arrival surface

Figure 14 shows a perspective view of the surface fitted to the original smoke puff positions and the observed times of first shock front arrival, i.e., to the data listed in Table 4.

The grid mesh size is 0.1 by 0.1 meters (scaled), about 2.5 feet square (unscaled), or about half that of the original smoke puff grid. The charge positions are indicated on the vertical distance axis.

The times-of-arrival surface is smooth enough to permit contouring, the contours in this case (isochrones) representing shock front shapes at different times, as shown in Figure 15, but the surface is not smooth enough to permit the calculation of gradient vectors which could be used to compute shock velocity vectors and shock strengths over the new grid.

Two attempts were made to obtain contours of shock strength. In the first, the times-of-arrival surface was smoothed by least-squares fitting low-order, one-dimensional polynomial functions to the time-of-arrival data along each grid row and column separately, and computing the derivatives of the fitted functions to obtain the associated components of the surface gradient vectors. Shock velocity vectors were obtained from the time-of-arrival gradients, and from these peak particle velocities were computed. The peak particle velocity (shock strength) surface is shown in Figure 16. The contours of this surface (not shown) did not exhibit any discontinuities across the boundaries of the shock front regions, as they would if surfaces had been fitted to the time of arrival in each region separately.

The results of a second method used to compute shock strength contours are shown in Figure 17. These were obtained

by interpolating shock radius at each value of peak particle velocity shown, for each shock front region in turn, using the peak particle velocity versus radius curves shown in Figures 8.1 - 8.3. Arcs of circles with these radii, centered on the appropriate points along the vertical charge axis, were then drawn in the regions to represent shock strength contours. These peak value contours are discontinuous across triple point locii and other region boundaries. As a result, some horizontal lines are crossed twice by the same contour or, in other words, indentical shock strengths can be found at two locations the same vertical distance from a reflecting surface, but at different radial distances from the vertical charge axis.

2.6 Field surface contours

Contours of equal particle velocity, density, hydrostatic overpressure, and dynamic pressure in the blast waves were determined for a series of times, using surfaces fitted to the various measured data fields at those times. Sample results are shown in Figures 18 through 21 at scaled times of 2.5, 4.0 and 9.0 ms. The shock fronts shown in these figures are obtained from the time-of-arrival surface (as were those in Figure 15). Field contours such as those shown can be drawn for any scaled time between 0.5 ms and 12.7 ms.

It should be re-stated that all of these results were obtained from the photography of the smoke puffs only and do

not rely on the results obtained using the refractive image analysis (Dewey et al., 1975).

2.7 Time histories

By mapping the physical properties of the blast waves at short time intervals its was possible to determine the time histories of these properites at any selected fixed position within the smoke puff grid. This was done at 15 fixed locations, three in the primary region of the lower charge and four in each of the three Mach stem regions, as shown in Figure 22. At each distance from the vertical axis through the charges in the Mach stem regions, each of the time history stations is approximately the same distance from either the interaction plane or the ground plane. (Particle velocity time histories could be interpolated closest to the grid edges because these were measured at puff locations, whereas the density and pressure data were measured at cell centers).

Time histories of particle velocity, density, hydrostatic overpressure and dynamic pressure at these locations are given in Figures 23 to 26. Time-histories of these physical properties of the blast wave can be provided at any other location within the smoke puff grid, on request.

The vertical line which forms the leading edge of a time-history plot represents the interpolated time-of-arrival of the first shock at the given location, and the height of this line represents the peak parameter value derived from the shock velocity analysis.

The dynamic pressures plotted in Figure 26 are maximum values, computed using both the x and y component of particle velocity. Similar plots were made of the horizontal components of dynamic pressure, but the differences were not significant since the y components of particle velocity at these locations were small. Other locations could have been chosen at which the y components would not have been insignificant.

Time histories for hydrostatic overpressure and total pressure are also plotted in Figures 27.1 to 27.4 for stations at the nominal positions of field-mounted pressure gauges on the "60 foot gun barrel". The gauges on this gun barrel were mounted at nominal elevations of 10, 20, 30, 40, 47, 50 and 53 feet. The time histories at these locations are compared to the gauge measurements (Keefer and Reisler, 1975). The total pressures were calculated in the manner described in the addendum to Volumes 1 and 2 which is incorporated in Volume 3. The variation with time of the integrated pressure (pressure impulse) is also shown in these figures, compared with similar integrals of the gauge data (Keefer and Reisler, 1975).

CHAPTER 3, DISCUSSION

3.1 Particle trajectory analysis, Shot 11

The methods used to analyze the smoke puff trajectories on Shot 11 were identical to those used for Shots 8, 9 and 10 and described in detail in the first three volumes of this report. The results for Shot 10 clearly indicated the superiority of one of several methods of analyzing shock strength, and only the results of this method have been reported for Shots 8, 9 and 11.

3.2 Primary shock strength of upper charge

The refractive image analysis of the shock fronts described by Dewey et al (1975) did not provide any information about the primary spherical shocks from the upper charges, and it was assumed that these charges had detonated satisfactorily. This assumption was validated for Shots 10 and 9 by the analysis of the particle trajectory time-of-arrival measurements. In Figure 7.1 the primary shock radii are plotted versus time for the upper and lower charges of Shot 11, together with the results obtained for the lower charge by the refractive image analysis. All three curves appear to be identical. The limited range of the data obtained for the primary shock from the upper charge did not permit an accurate calculation of the variation of the shock strength with distance. However, the results for the lower charge, in Figure 8.1,

show a similar shock strength variation with distance to that obtained from the refractive image analysis and one which is very similar to Brode's (1957) calculation for TNT.

3.3 Comparison of Mach shock strength over different surfaces

The refractive image analysis of Shot 11 (Dewey et al., 1975) showed what appeared to be a significant difference between the strengths of the Mach shocks over the rough ground and beneath the interaction plane between the two charges. The results of the particle trajectory analysis given in Figures 8.2 and 8.3 show a similar but smaller difference. The RIA measurements were made as close as possible to the reflecting surfaces, 0.5 m above the ground plane and 0.2 m below the interaction plane, whereas in the PTA case the results represent an average of measurements made at puff positions at heights ranging between 1.0 and 7.0 m. Obtaining particle trajectory data near the ground surface was a particular problem on Shot 11 since 13 of the 20 smoke puffs in the bottom row either failed to detonate or could not be distinguished in the film images (they were white smoke puffs placed against a background of the snow-covered, ploughed earth). The results in Figures 8.2 and 8.3 therefore indicate that the difference in shock strength over the ground compared with that at the interaction plane may be dependent on the height above the ground - not an unexpected result.

In addition, determination of Mach shock strength from measurements of the times of shock arrival at smoke puffs at various distances from the reflecting surfaces is difficult because an assumption must be made about the exact shape of the Mach shock front, in order to correctly assign shock radius values at smoke puff positions. At or near a reflecting surface the problem of shock shape is not so important as it is assumed that the shock is perpendicular to the surface. Details of this aspect in the PTA case and the manner in which the problem was dealt with for Shots 8 through 11 are described in Volume 1 of this report.

The possible magnitude of the difference between Mach stem shock strength over the rough ground and at the interaction plane is best illustrated in Figure 17, which shows peak particle velocity isotachs derived from the RIA results presented in Figures 8.1 - 8.3. It can be seen, for example, that the Mach 0.5 isotach at the interaction plane is significantly farther from the vertical charge axis than it is at the ground plane. The apparent discontinuity in the Mach 0.5 isotach at the plane y = 0.8 cannot be maintained and there will be a transfer of energy between the two shock waves causing the upper Mach stem to slow down and the lower to strengthen.

3.4 Resolution of time histories

The time histories of density and pressure given in Figures 24 and 25 do not always show a sharp rise at the shock front. This is not a real effect but one inherent to the present method of particle trajectory analysis, which does not permit a high resolution of density in space or in time because the average density of the air within a rectangular cell defined by four smoke puffs cannot be calculated accurately until the shock has completely traversed the cell. The time of complete traversal may be as much as 5 ms, or 0.6 ms when scaled.

For the same reason the calculated time histories sometimes anticipate the time of shock front arrival (e.g. Fig. 24.4, position 4.0, 0.4) and do not resolve weaker shocks subsequent to the first, although these may be detected occasionally as a rounded bump in the normally exponentially decaying curve. Efforts are being made to improve the space and time resolution of density and pressure calculated from the particle trajectories.

The lack of resolution close to the shock front does not occur in the case of particle velocity, which can be measured with reasonable accuracy as soon as the shock has traversed the relatively small space represented by an individual smoke puff. This improved resolution is manifested also in the dynamic pressure histories which depend on particle velocity squared.

3.5 Comparisons with gauge results

The hydrostatic and total pressure time-histories were calculated at gauge positions within the smoke puff grid and the results from the particle trajectory analysis are compared with the corresponding transducer outputs in Figures 27.1 to 27.4.

The agreement between the results from the two measurement methods is good although, as previously discussed, the poor time resolution of the particle trajectory results does not permit indentification of multiple shocks. This is illustrated in Figure 27.1 for the 60.20 location. However, the agreement between the two impulse curves is excellent.

The good agreement between the total-pressure time-histories from the two measurement methods shown in Figures 27.3 and 27.4 further confirms the validity of the technique used to calculate the total pressure, as described in the addendum to Volumes 1 and 2 of this report.

In considering the above comparisons it must be remembered that determination of pressure time-histories was not an original objective of the particle trajectory analysis project, but the reasonable agreement with gauge measurements gives some indication of the reliability of the method. Also the gauge measurements were made on the opposite side of the charges to the smoke puff grid so that some differences might be expected due to slight non-symmetries of the blast waves.

Although the effect is more clearly seen from the gauge results rather than the particle trajectory analysis, it is interesting to note the difference in the blast wave signature at location 60.10, 10ft above the rough ground, compared with that at 60.40, 10ft below the interaction plane (Fig. 27.1). Above the ground the two initial shocks indicate that the gauge was above the triple point and detected the primary and the reflected shock. Below the interaction plane the single shock indicates that the gauge was in the Mach stem below the triple point. This confirms the photogrammetrical measurements (Dewey, et al., 1975) which showed the triple point above the ground at this location to be at height of approximately 5.8 ft and to be approximately 9.6 ft below the interaction plane, i.e., almost coinciding with the gauge position.

3.6 Comparisons of time histories at different heights

Dewey et al., (1975) pointed out that although the shock strength below the interaction plane at a given distance from the vertical charge axis was greater than it was above the rough ground, the gauge results showed that the hydrostatic pressure impulse was greater along the ground. In other words, along the ground the peak pressure value at the shock was less, but the decay of the pressure was slower and the duration longer.

The results from the particle trajectory analysis have been studied to see if these conclusions are confirmed. Unfortunately, gaps in the smoke puff grid close to the roughened ground, seen in figure 22, meant that fewer results were obtained in this region than had been hoped for. Nevertheless, a number of comparisons between time histories below the interaction plane and above the ground are possible. The appropriate time histories to be compared are the particle velocity profiles in figure 23.2 at (2.5, 1.6) and (2.5, 0.2), in figure 23.3 at (3.0, 1.6) and (3.0, 0.2), and in figure 23.4 at (4.0, 1.6) and (4.0, 0.3); the density profiles in figure 24.3 at (3.0, 1.6) and (3.0, 0.4) and in figure 24.4 at (4.0, 1.6) and (4.0, 0.4); the hydrostatic pressure profiles in figure 25.3 at (3.0, 1.6) and (3.0, 0.4), and in figure 25.4 at (4.0, 1.6) and (4.0, 0.4), and the dynamic pressure profiles in figure 26.3 at (3.0, 1.6) and (3.0, 0.4) and in figure 26.4 at (4.0, 1.6) and (4.0, 0.4). Although the differences are not great when the accuracy of these profiles is considered, it appears to be significant that in every one of the nine comparisons, close to the rough ground the shock front arrives later and the peak value is less than below the interaction plane, but the compared history profiles always cross so that in the latter part of the wave both the hydrostatic and the dynamic pressure are greater above the ground than at the interaction plane.

<u>References</u>

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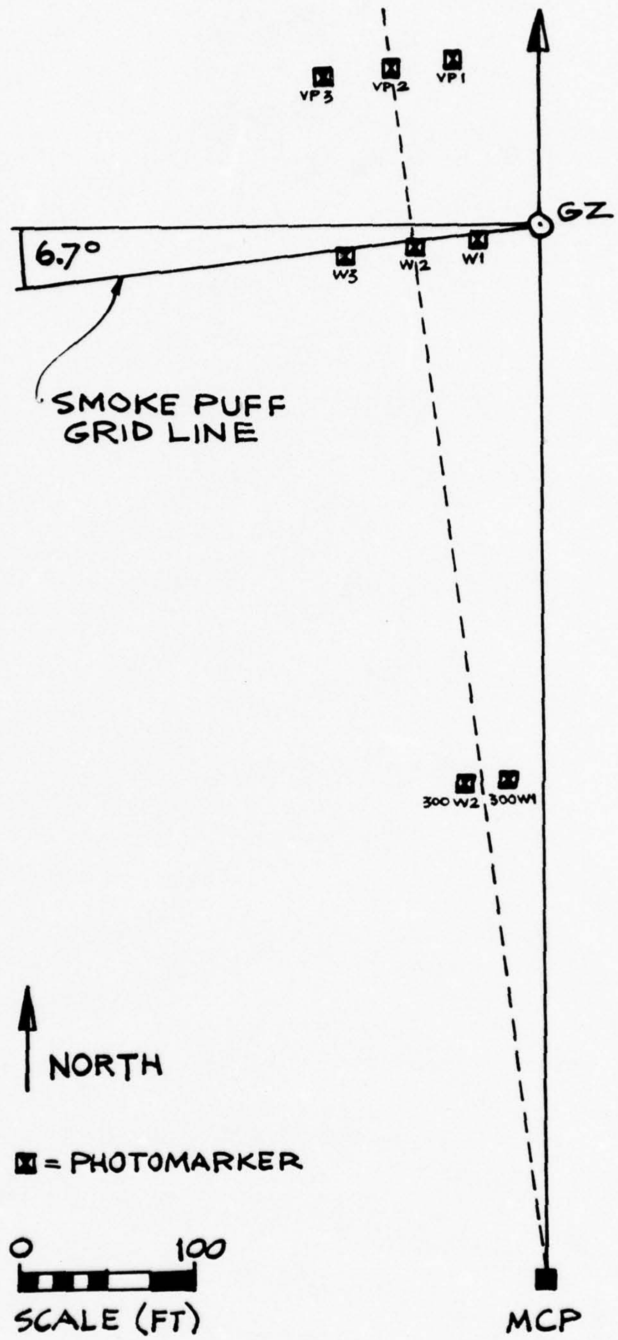

Fig. 1 Plan view of test site, Dipole West/11

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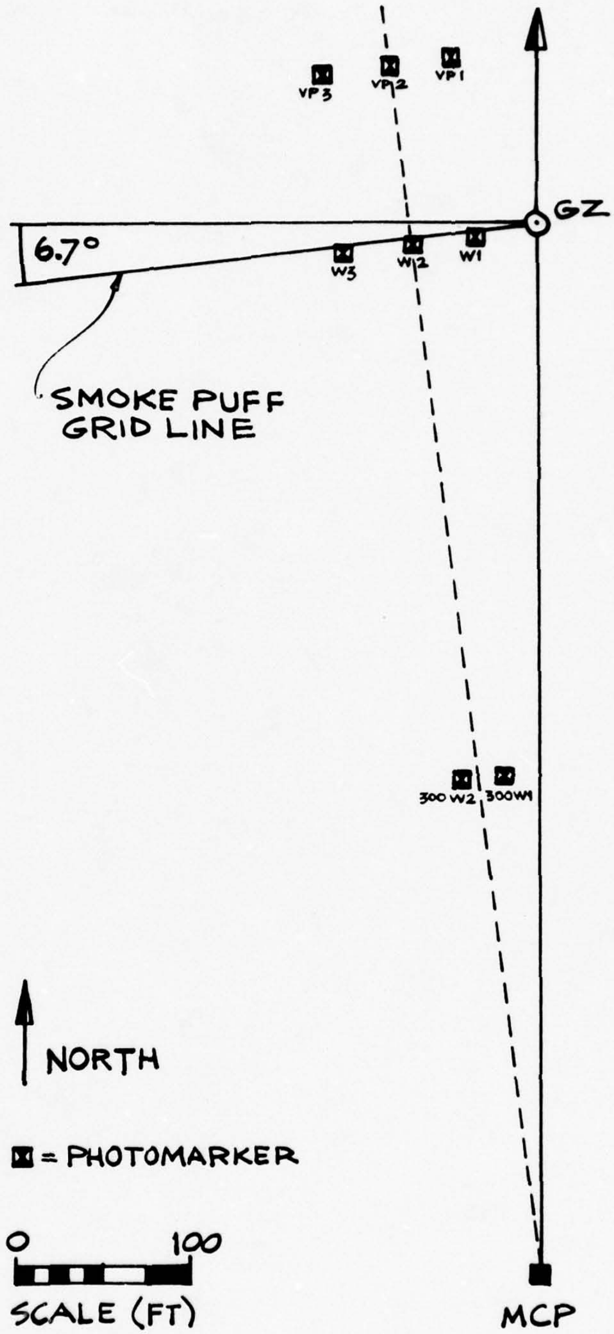
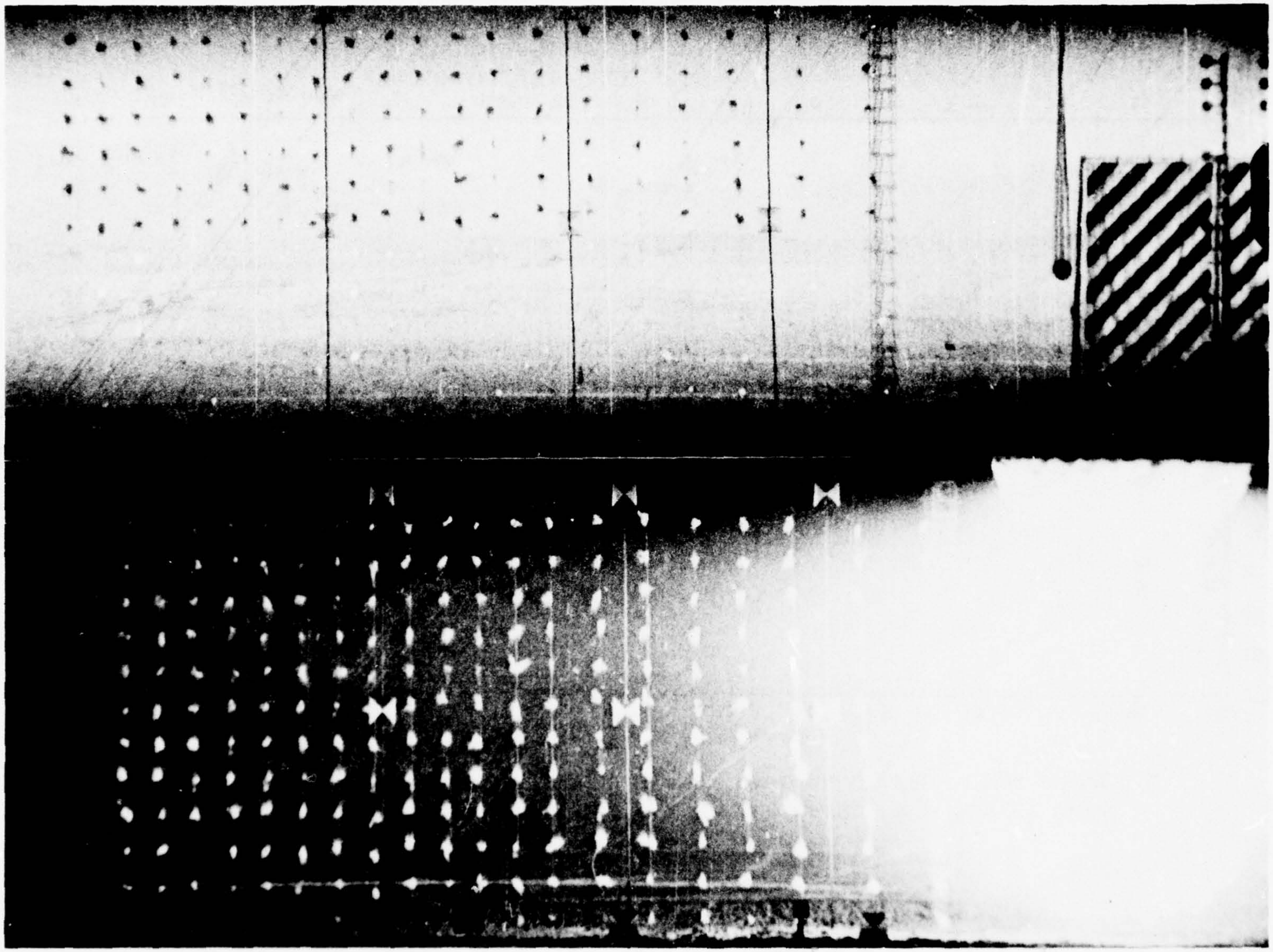


Fig. 1 Plan view of test site, Dipole West/11

a)



b)

Fig. 2 Field of View of Camera—Smoke puff grid, DIPOLE WEST/11:
a) before detonation, b) approximately 3 ms after detonation.

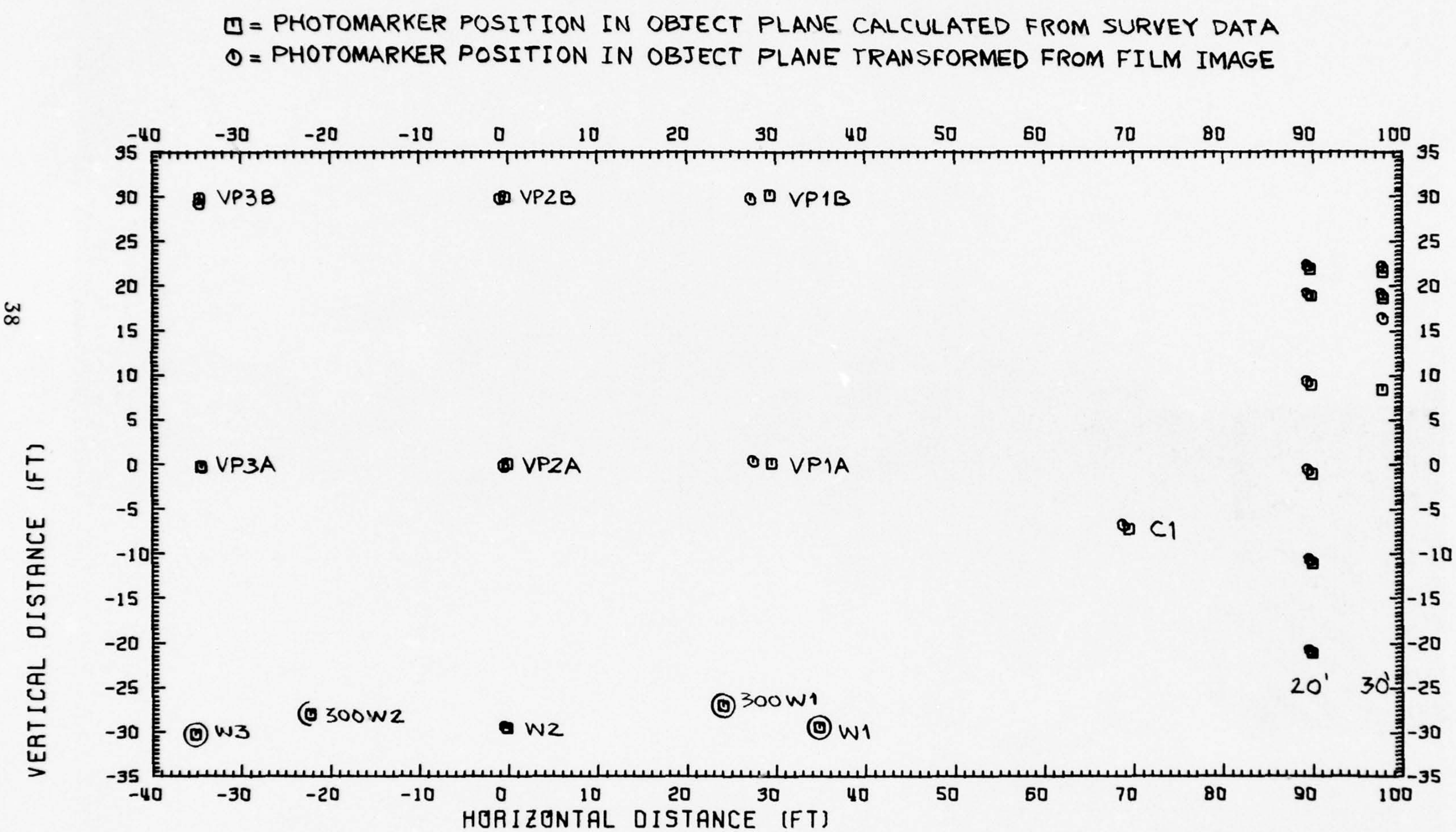


Fig. 3 CAMERA CALIBRATION, DIPOLE WEST/11

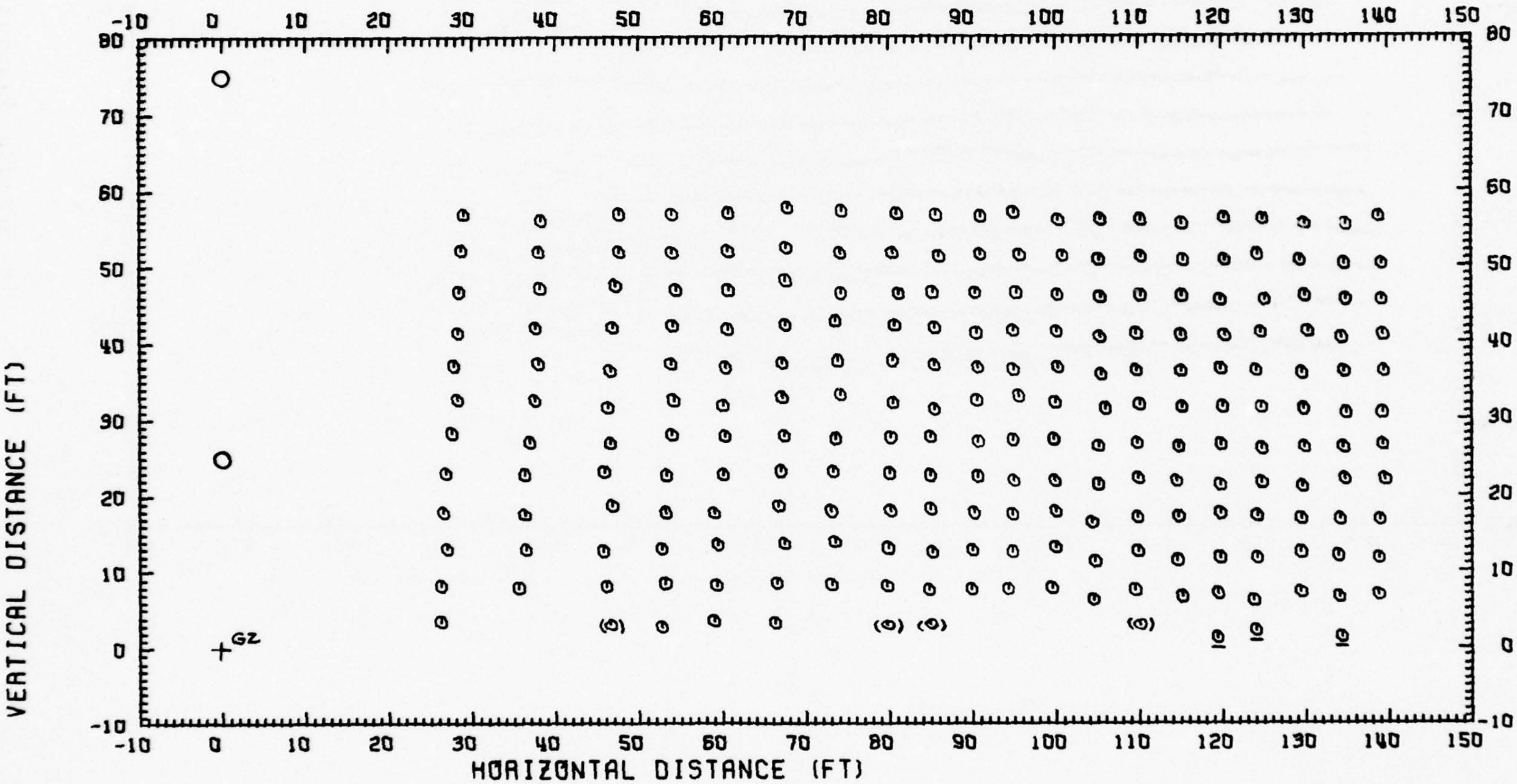


Fig. 4 SMOKE PUFF GRID, DIPOLE WEST/11

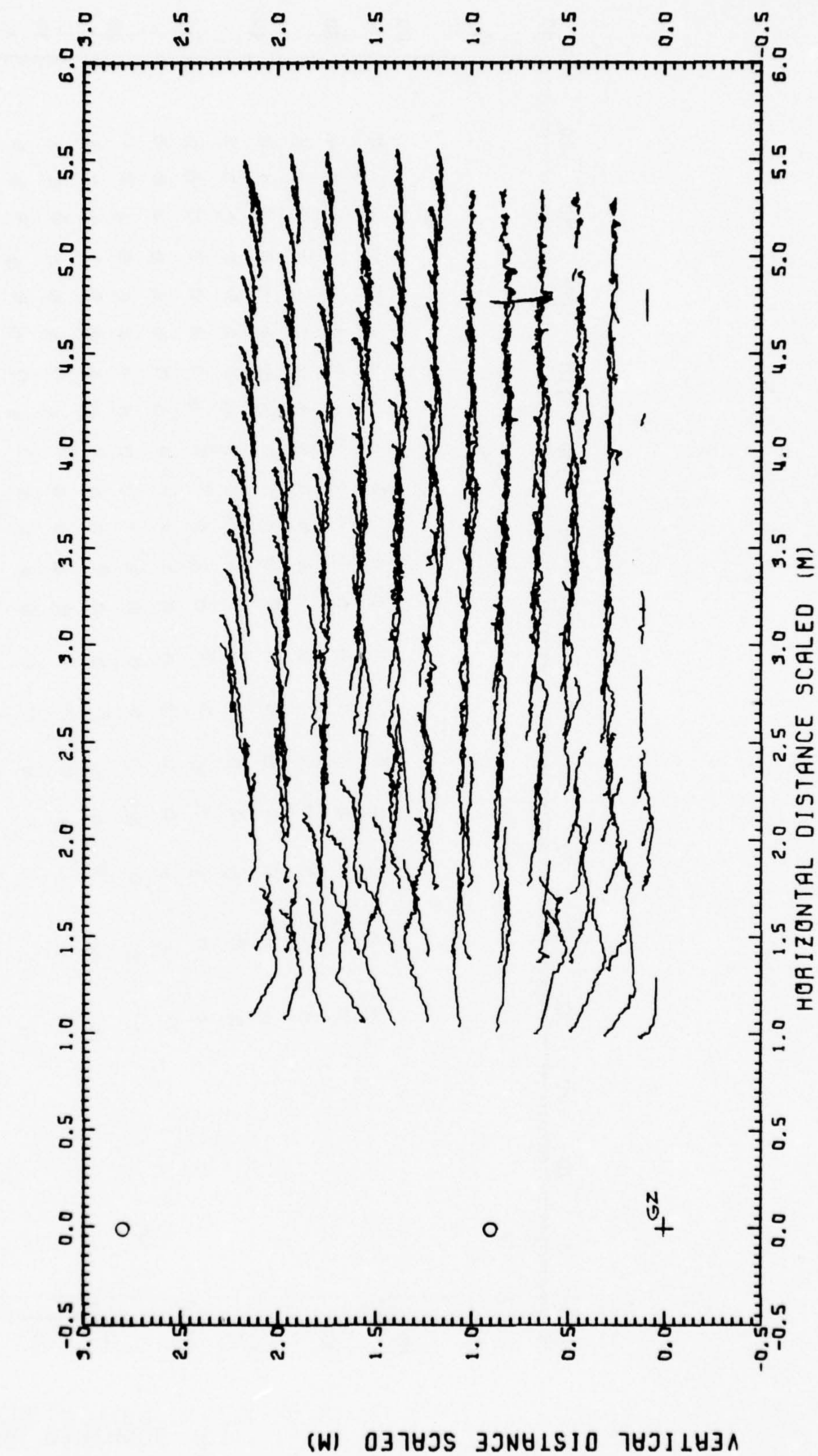


Fig. 5 PARTICLE TRAJECTORIES, DIPOLE WEST/11

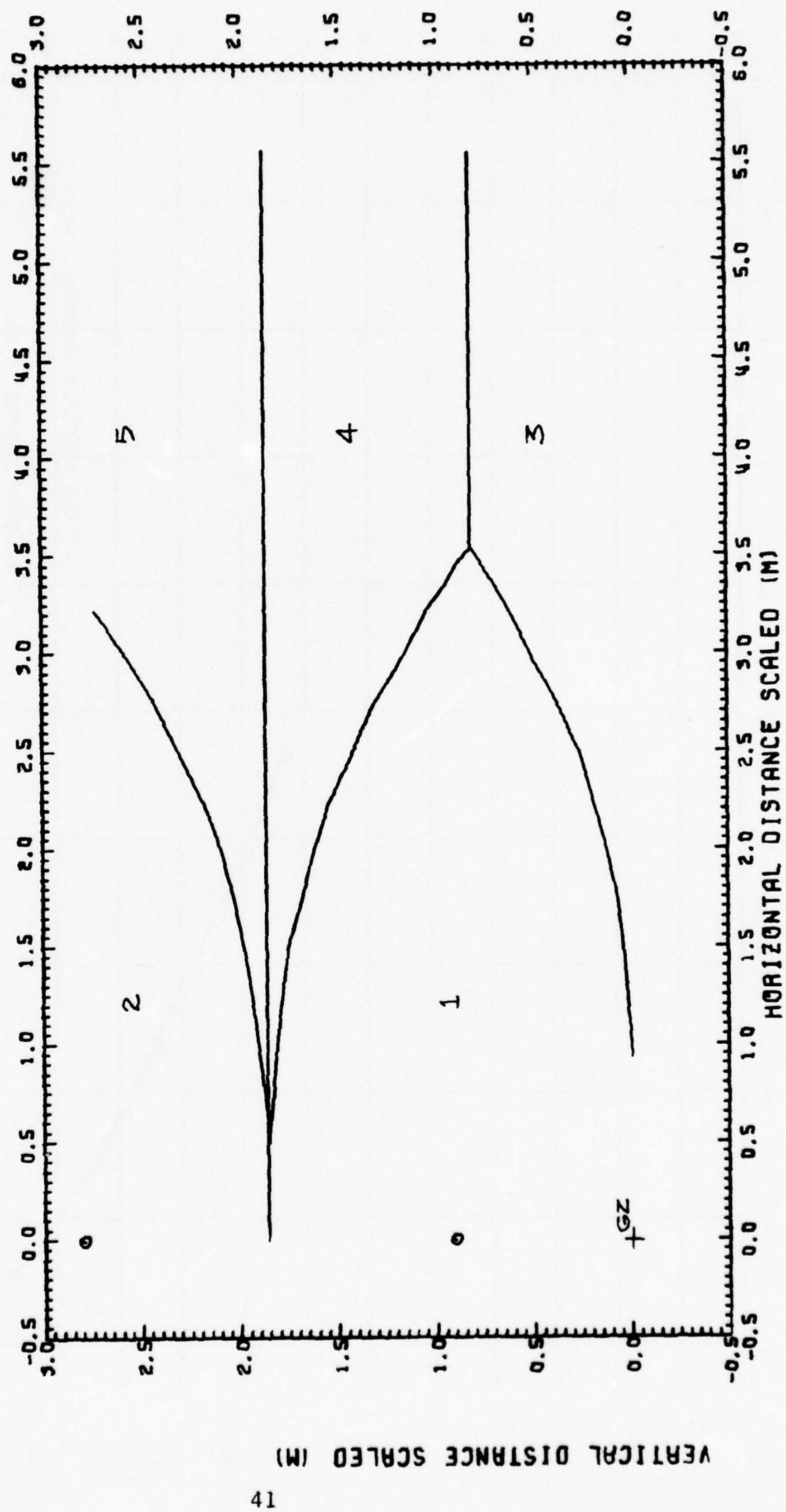


Fig. 6 REGIONS DEFINITION, DIPOLE WEST/11

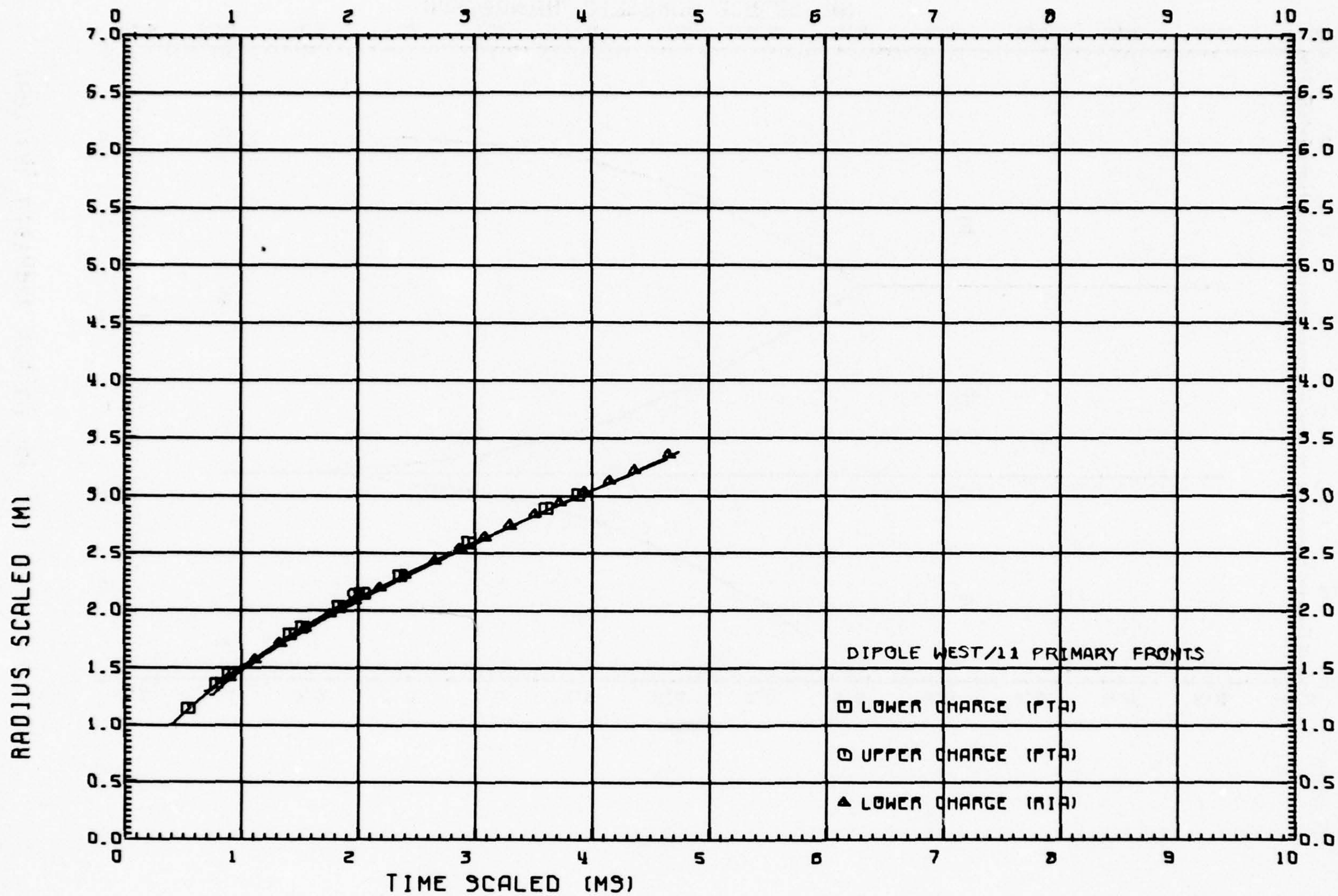


Fig. 7.1 SHOCK TRAJECTORIES, DIPOLE WEST/11

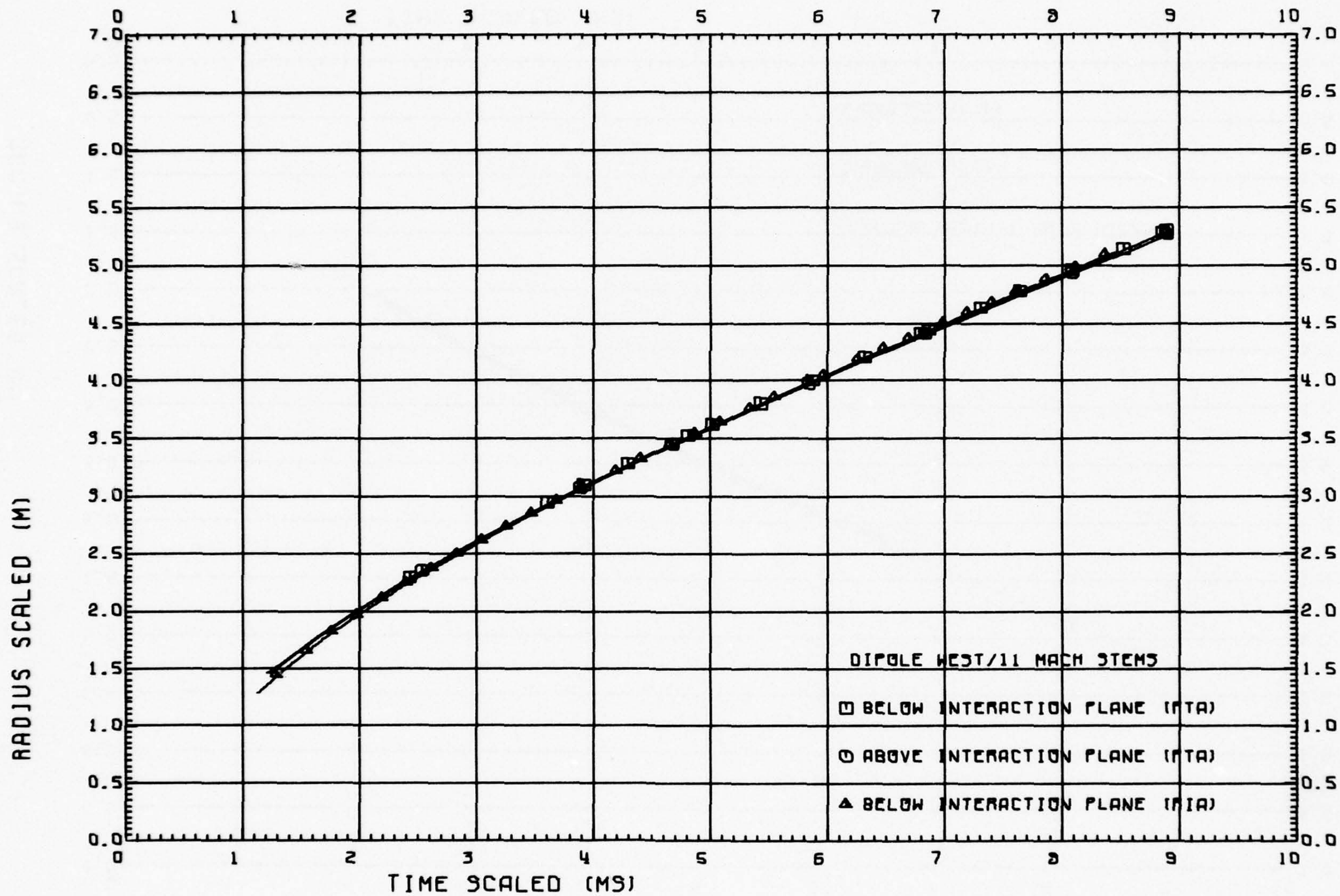


Fig. 7.2 SHOCK TRAJECTORIES, DIPOLE WEST/11

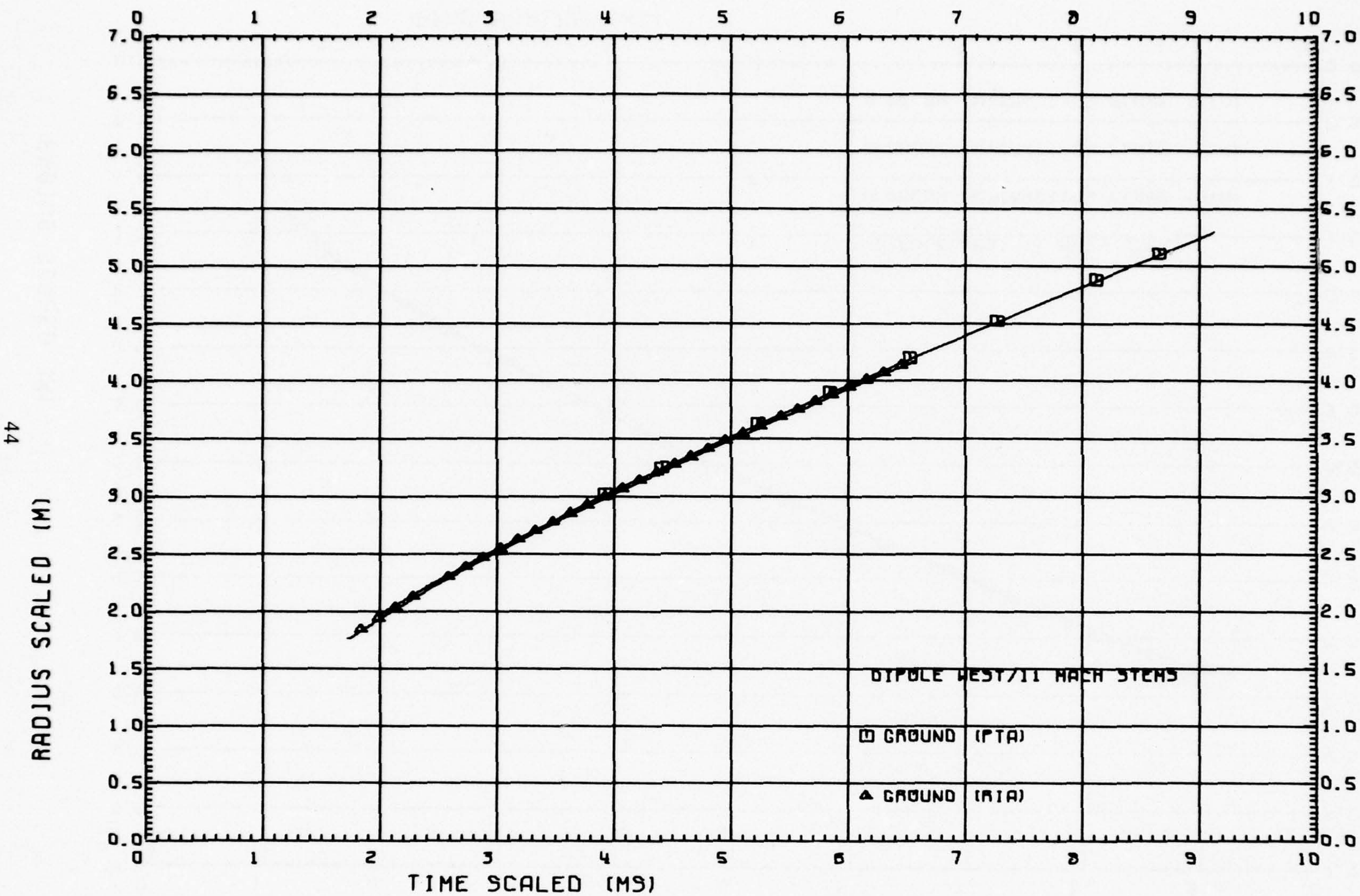


Fig. 7.3 SHOCK TRAJECTORIES. DIPOLE WEST/11

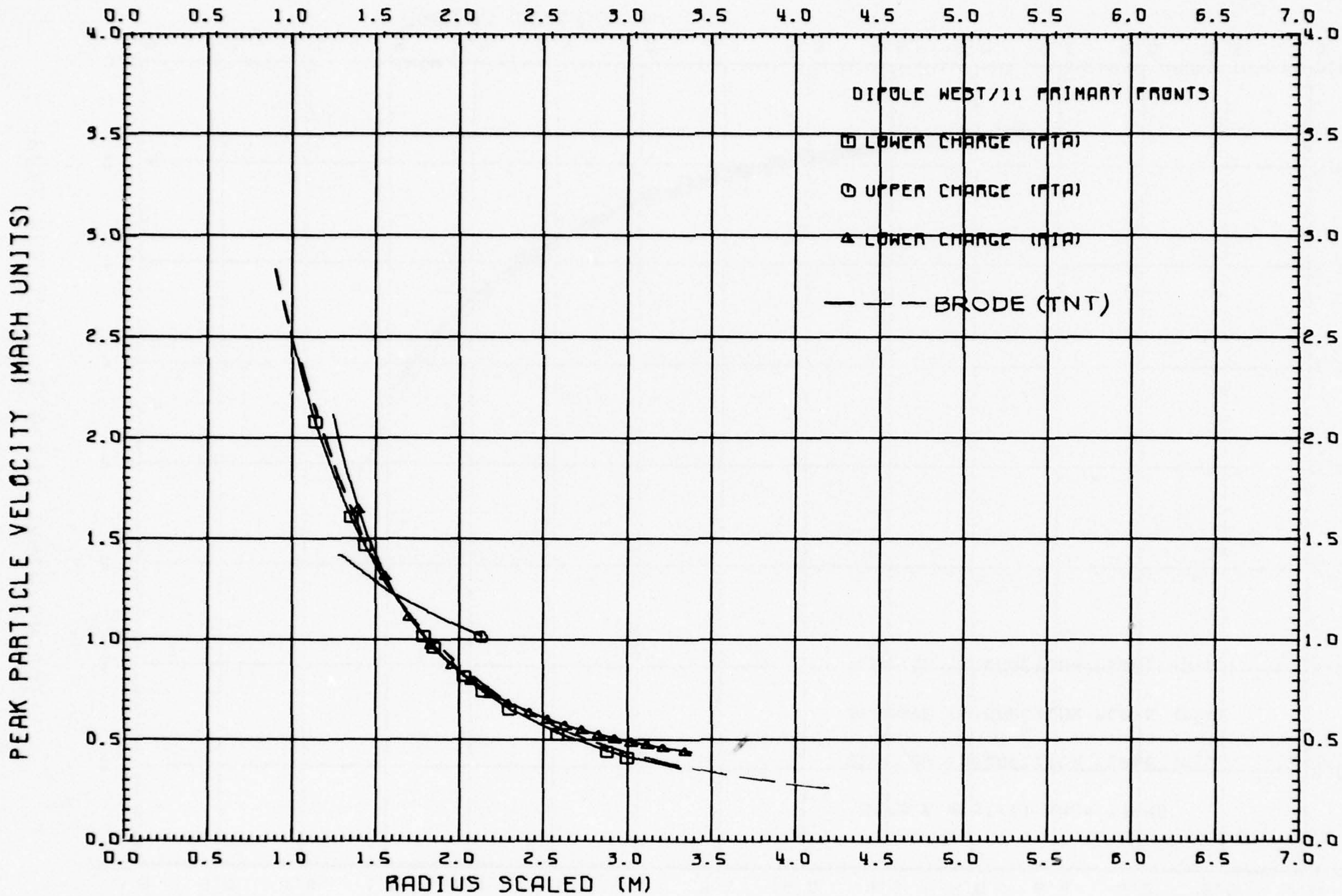


Fig. 8.1 SHOCK STRENGTH, DIPOLE WEST/11

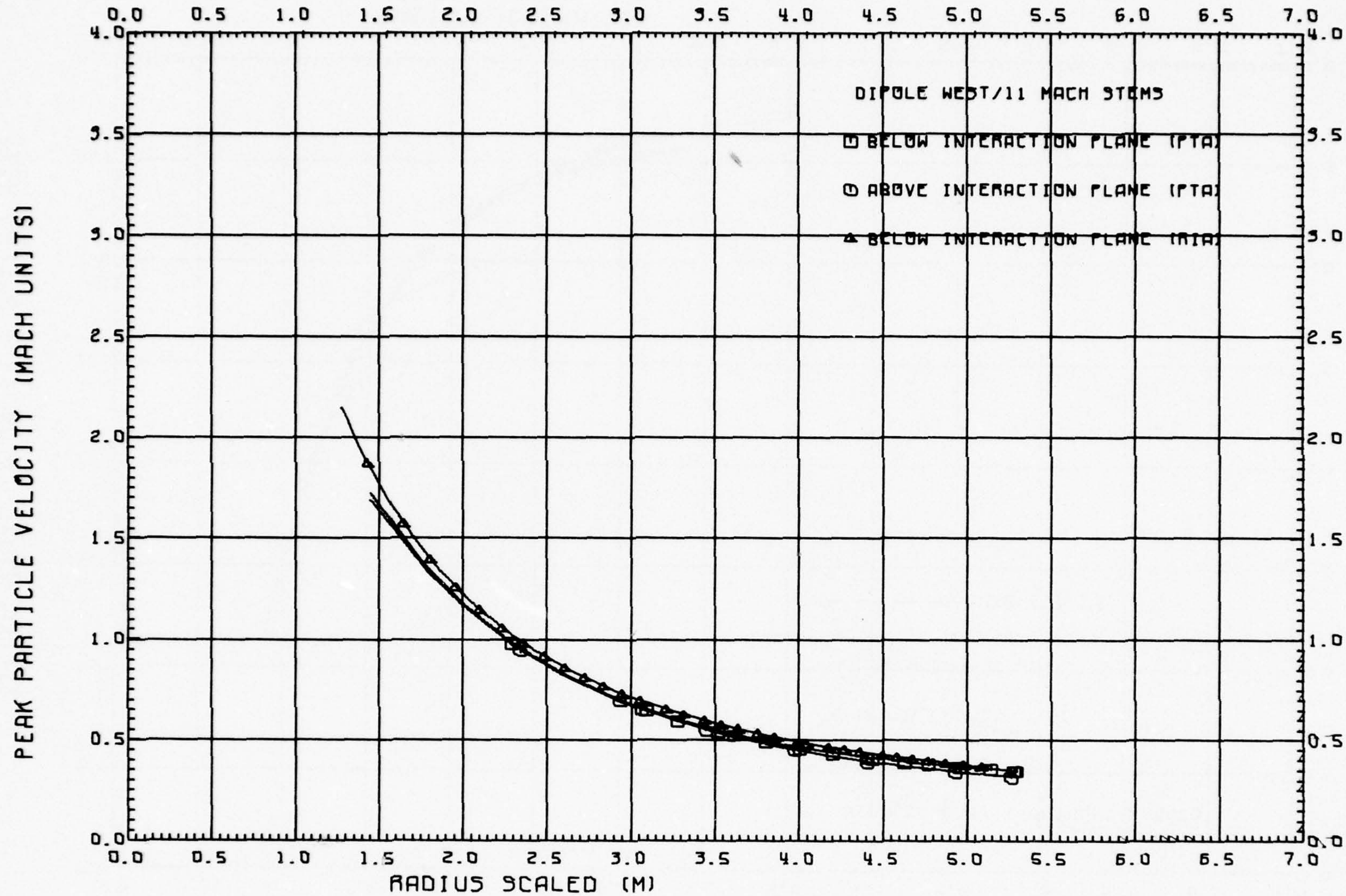


Fig. 8.2 SHOCK STRENGTH, DIPOLE WEST/11

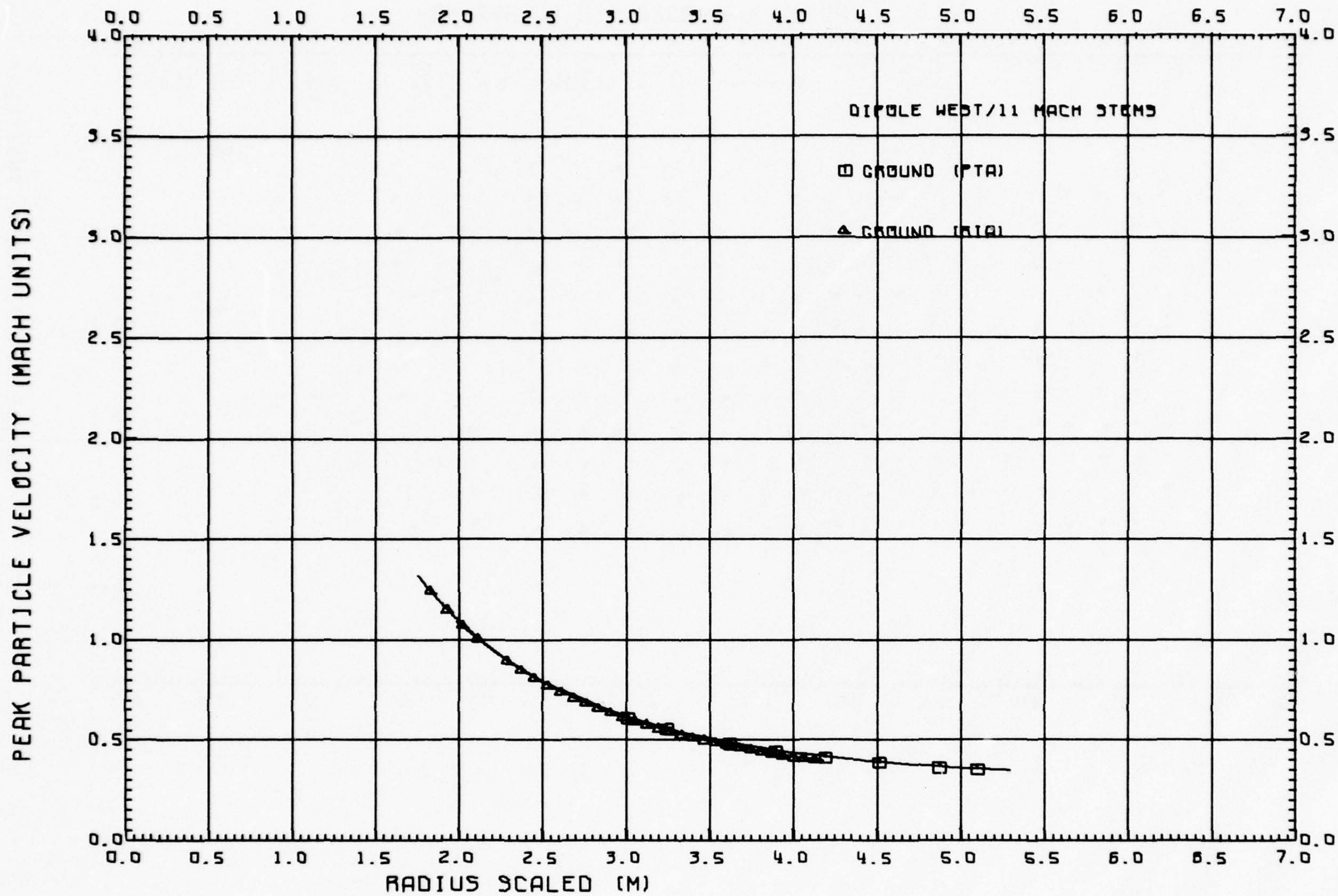


Fig. 8.3 SHOCK STRENGTH, DIPOLE WEST/11

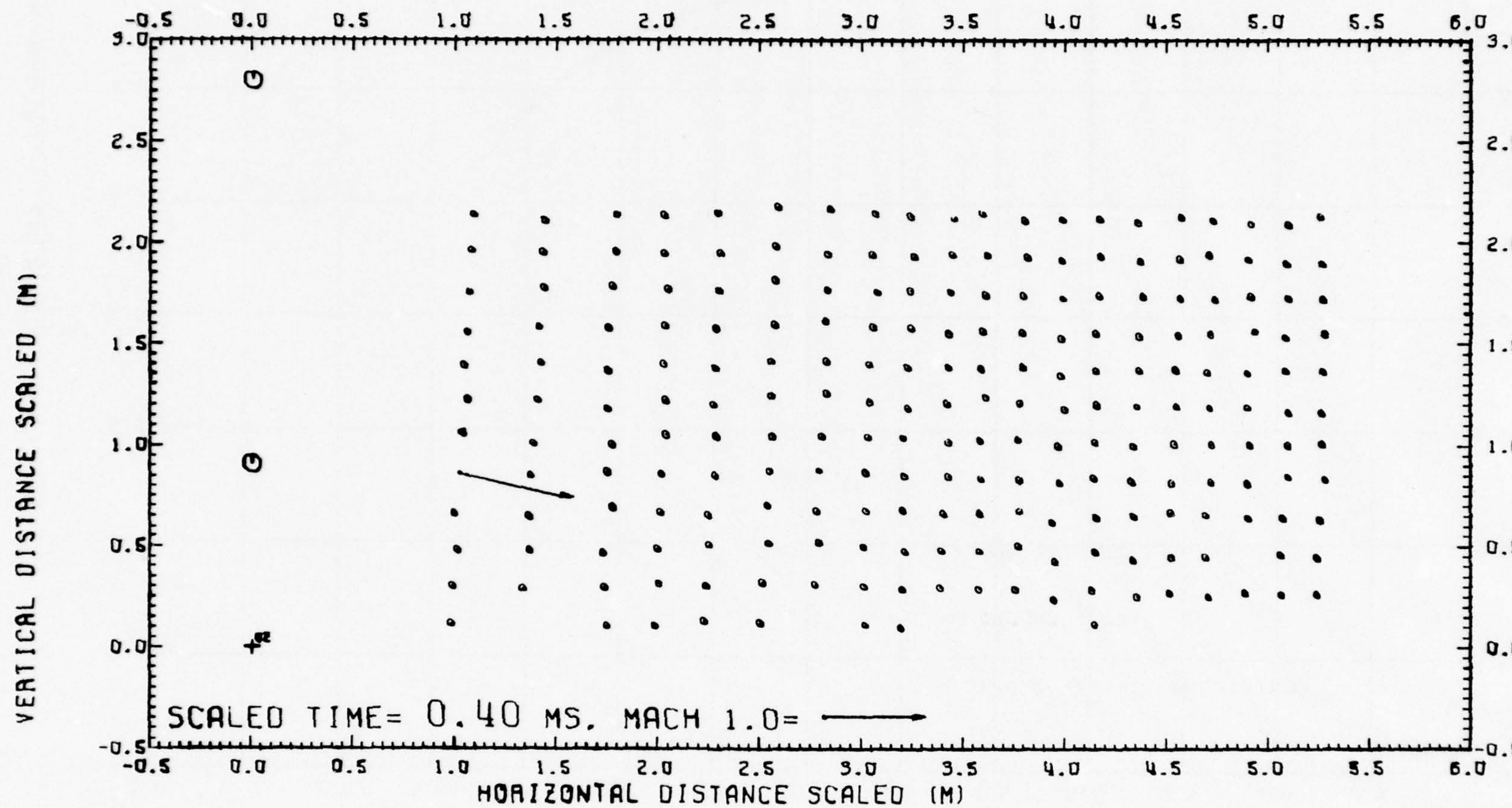


Fig. 12.1 PARTICLE VELOCITY FIELD, DIPOLE WEST/11

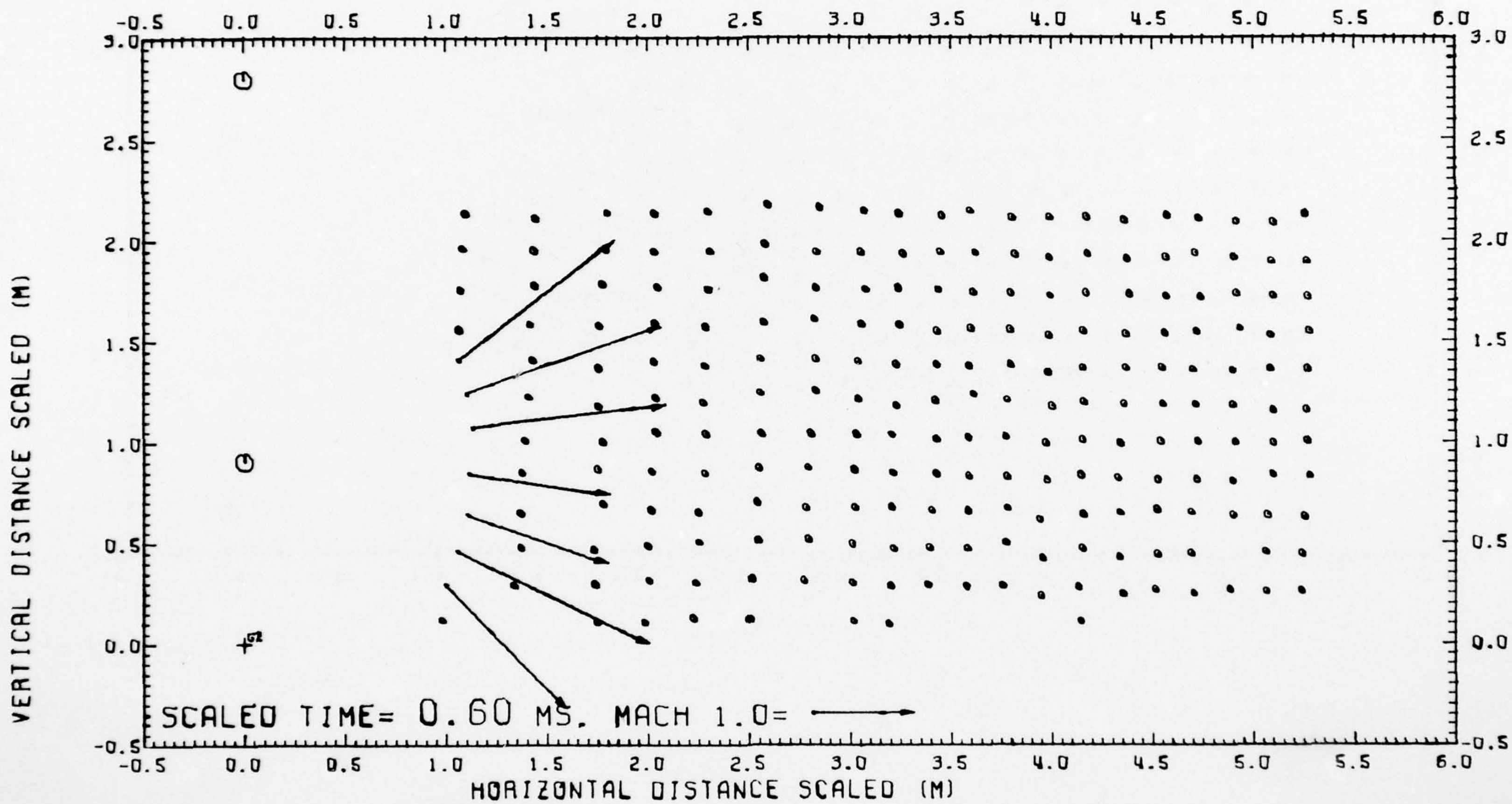


Fig. 12.2 PARTICLE VELOCITY FIELD, DIPOLE WEST/11

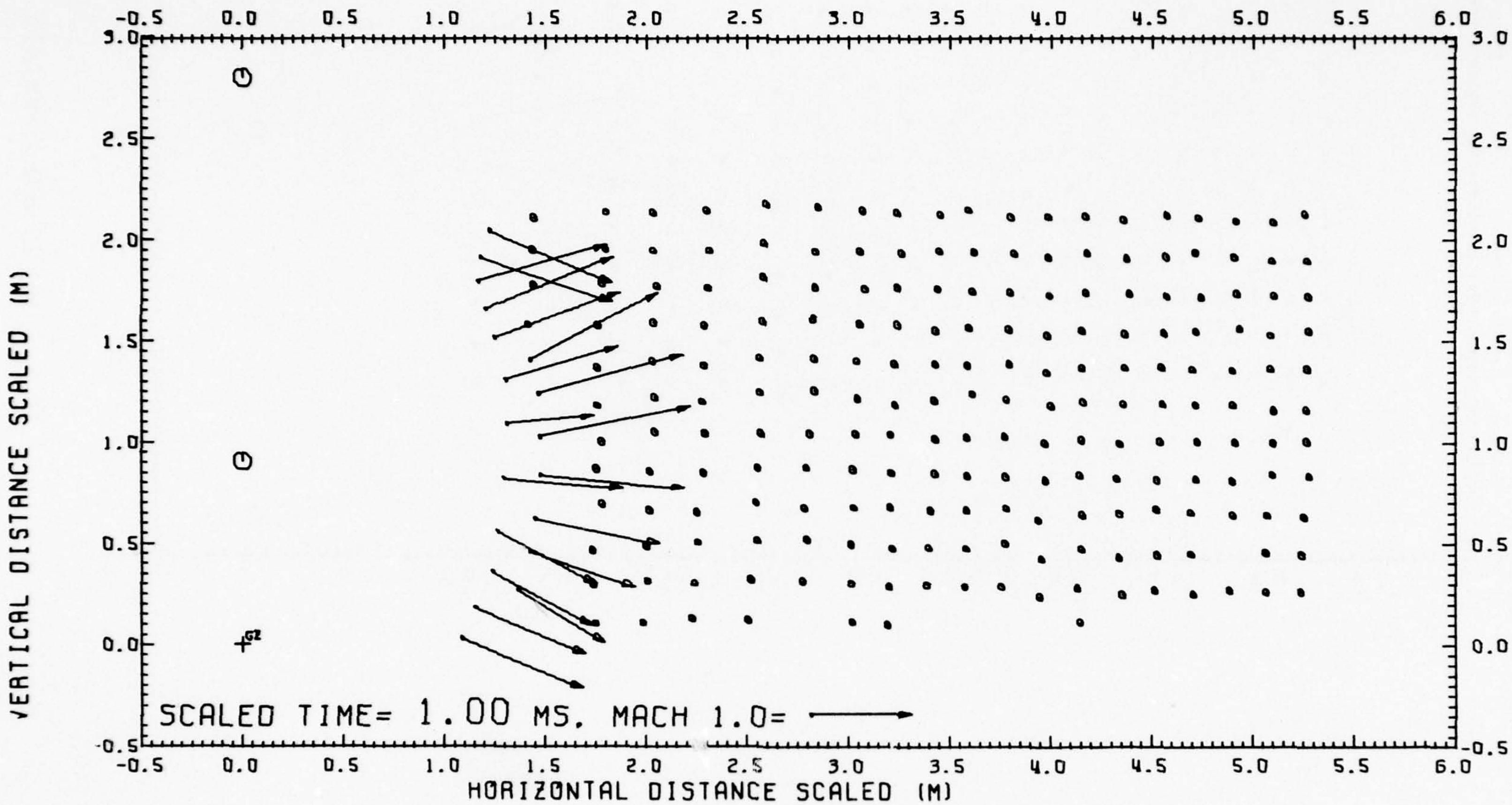


Fig. 12.3 PARTICLE VELOCITY FIELD, DIPOLE WEST/11

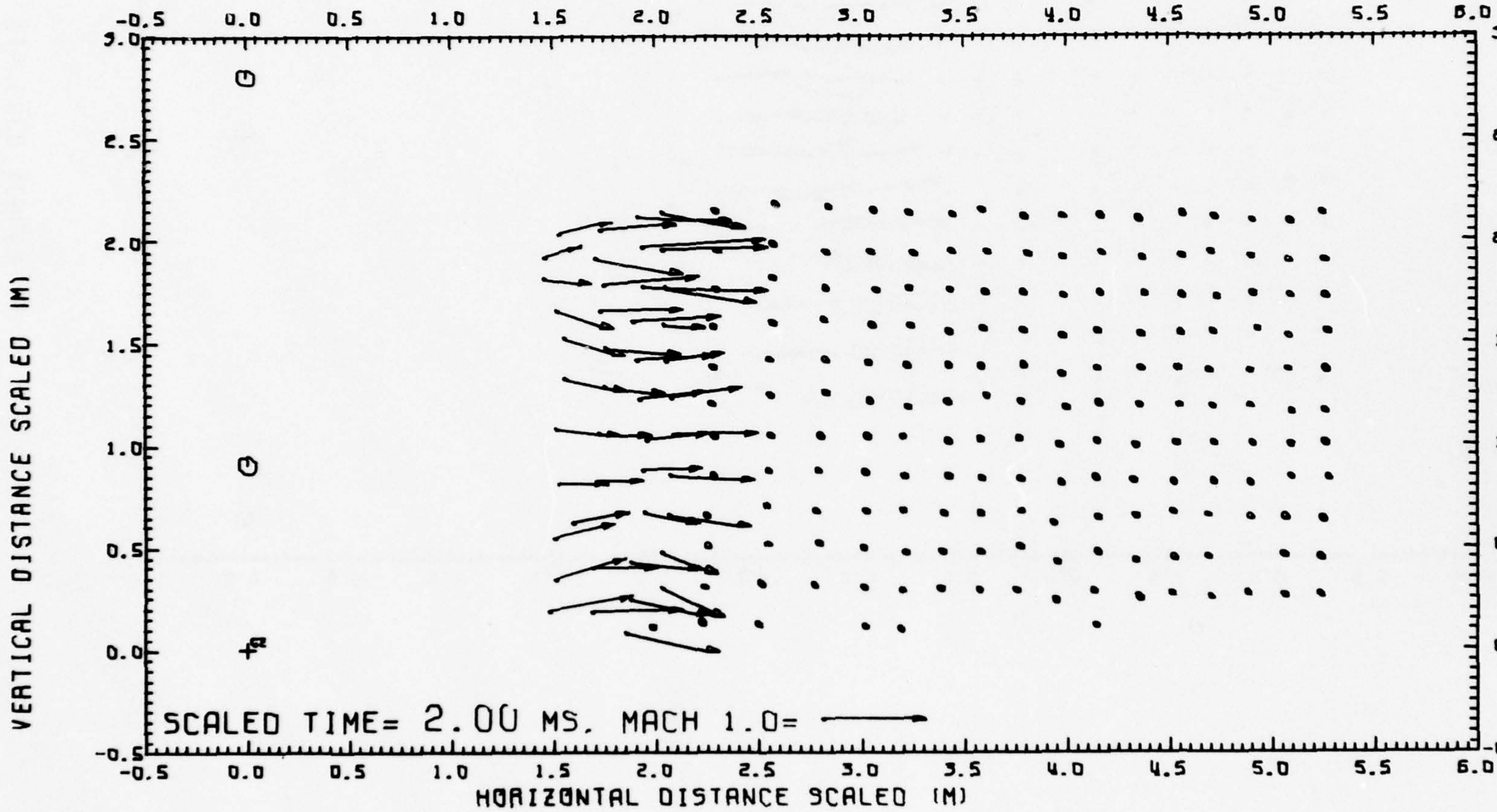


Fig. 12.4 PARTICLE VELOCITY FIELD, DIPOLE WEST/11

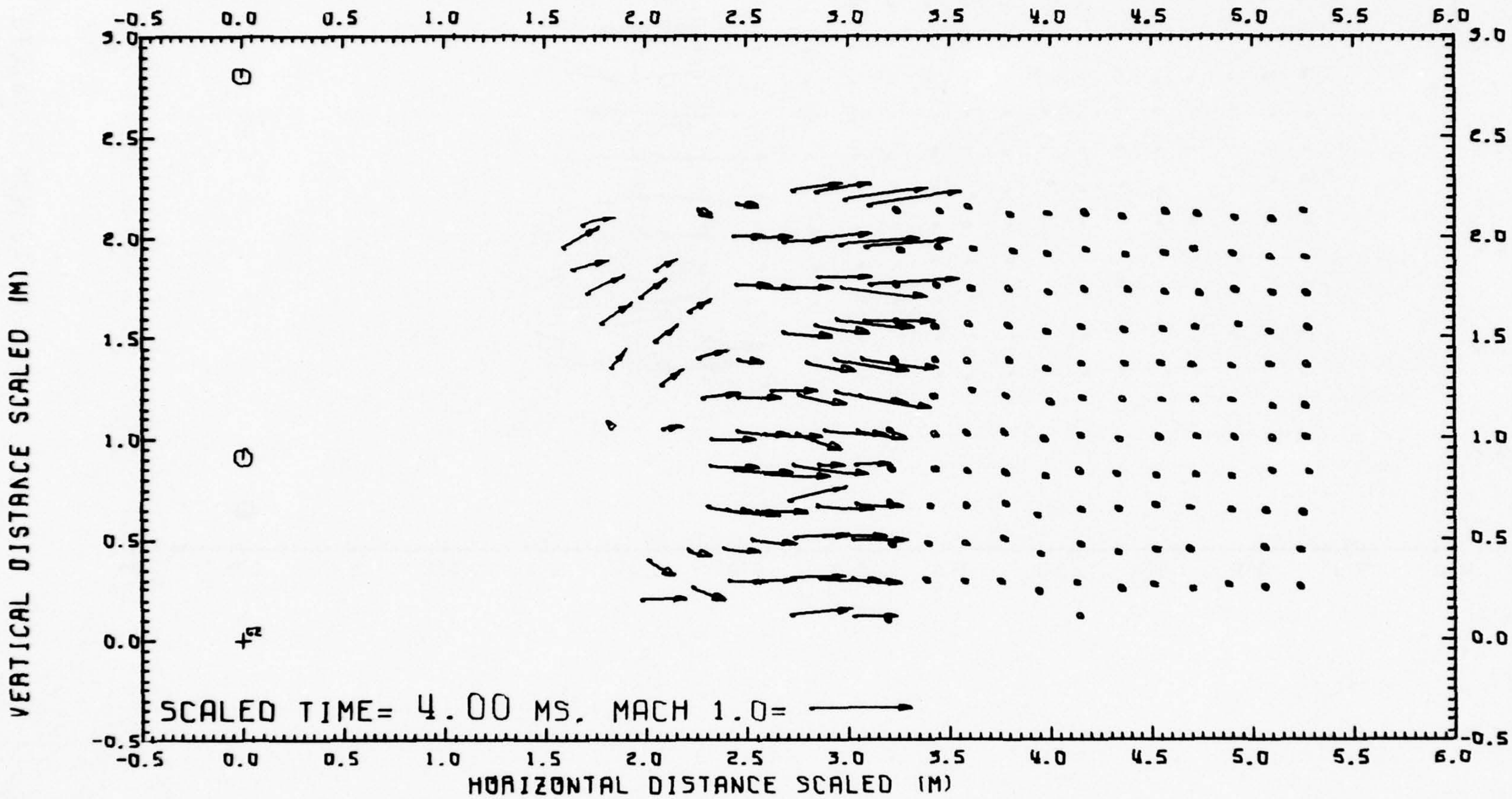


Fig. 12.5 PARTICLE VELOCITY FIELD, DIPOLE WEST/11

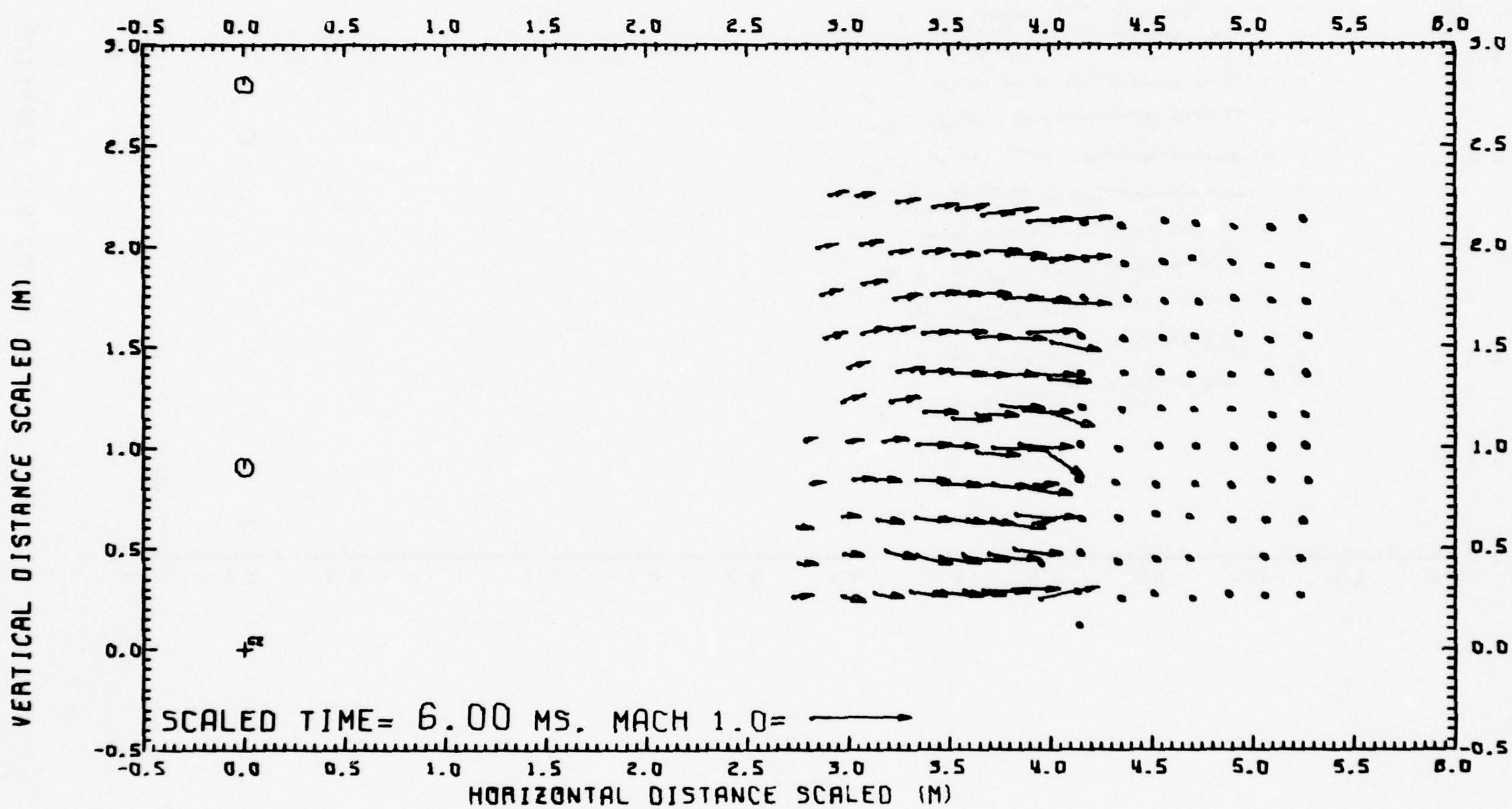


Fig. 12.6 PARTICLE VELOCITY FIELD, DIPOLE WEST/11

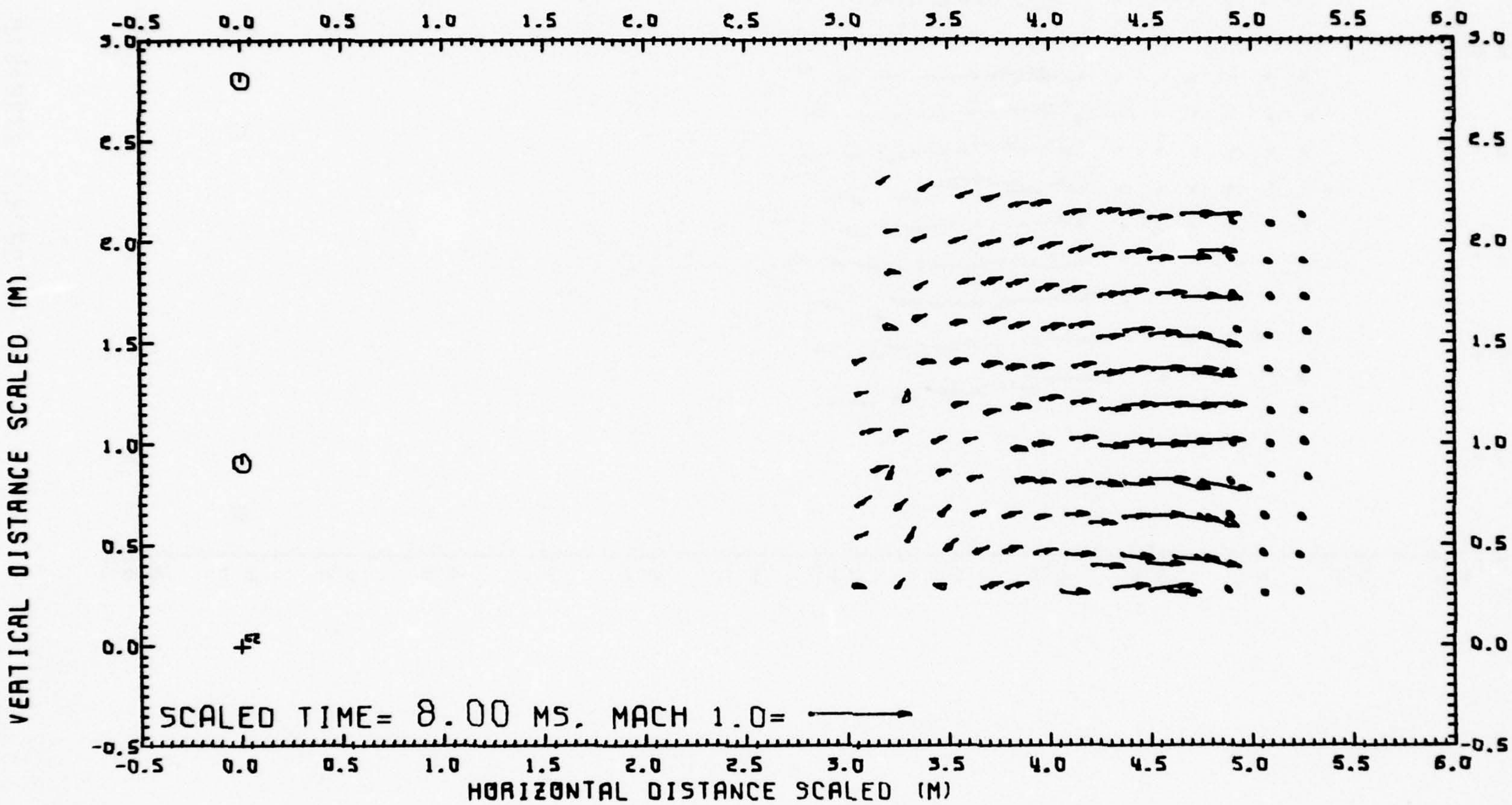


Fig. 12.7 PARTICLE VELOCITY FIELD, DIPOLE WEST/11

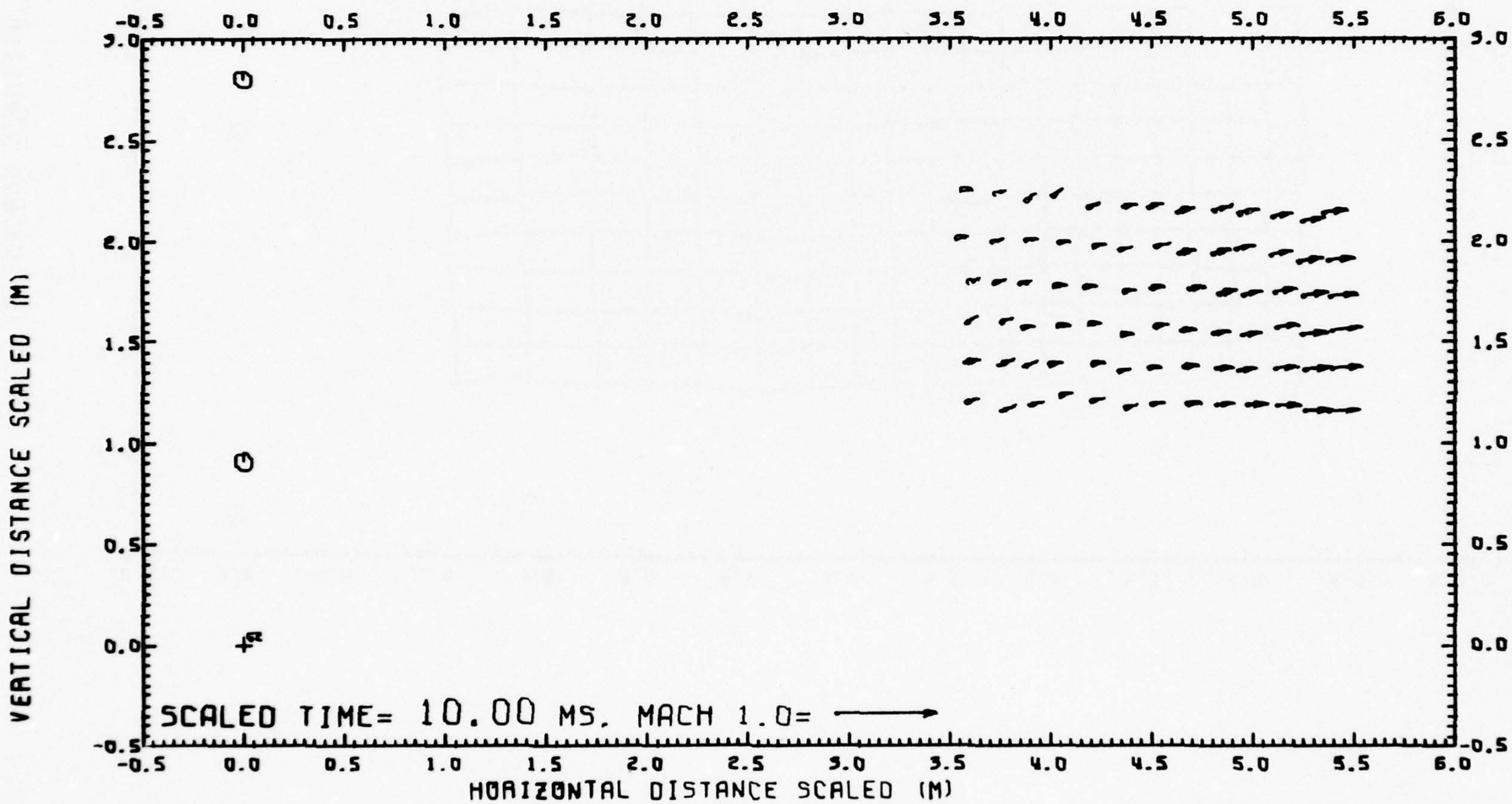


Fig. 12.8 PARTICLE VELOCITY FIELD, DIPOLE WEST/11

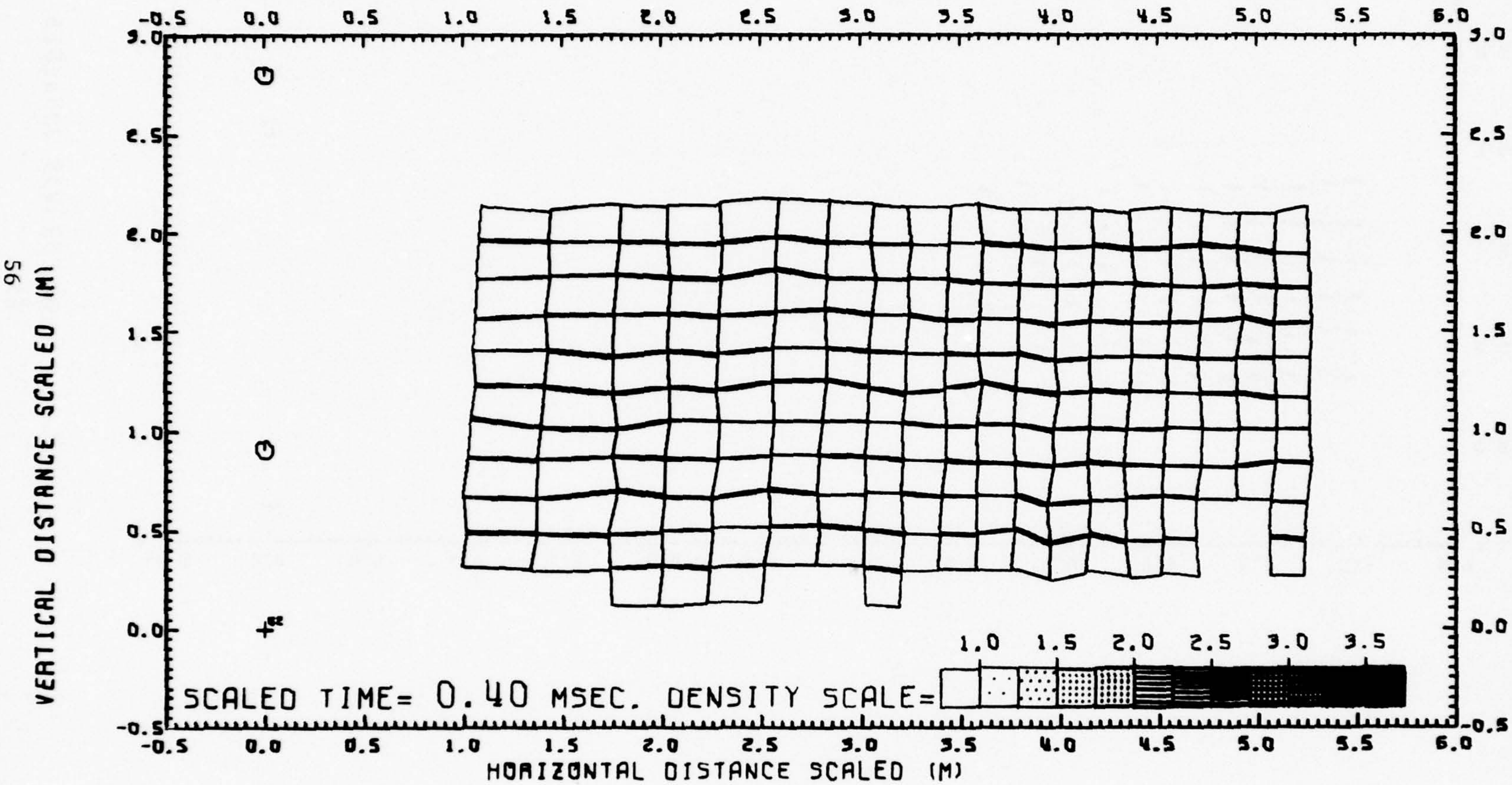


Fig. 13.1 DENSITY FIELD, DIPOLE WEST/11

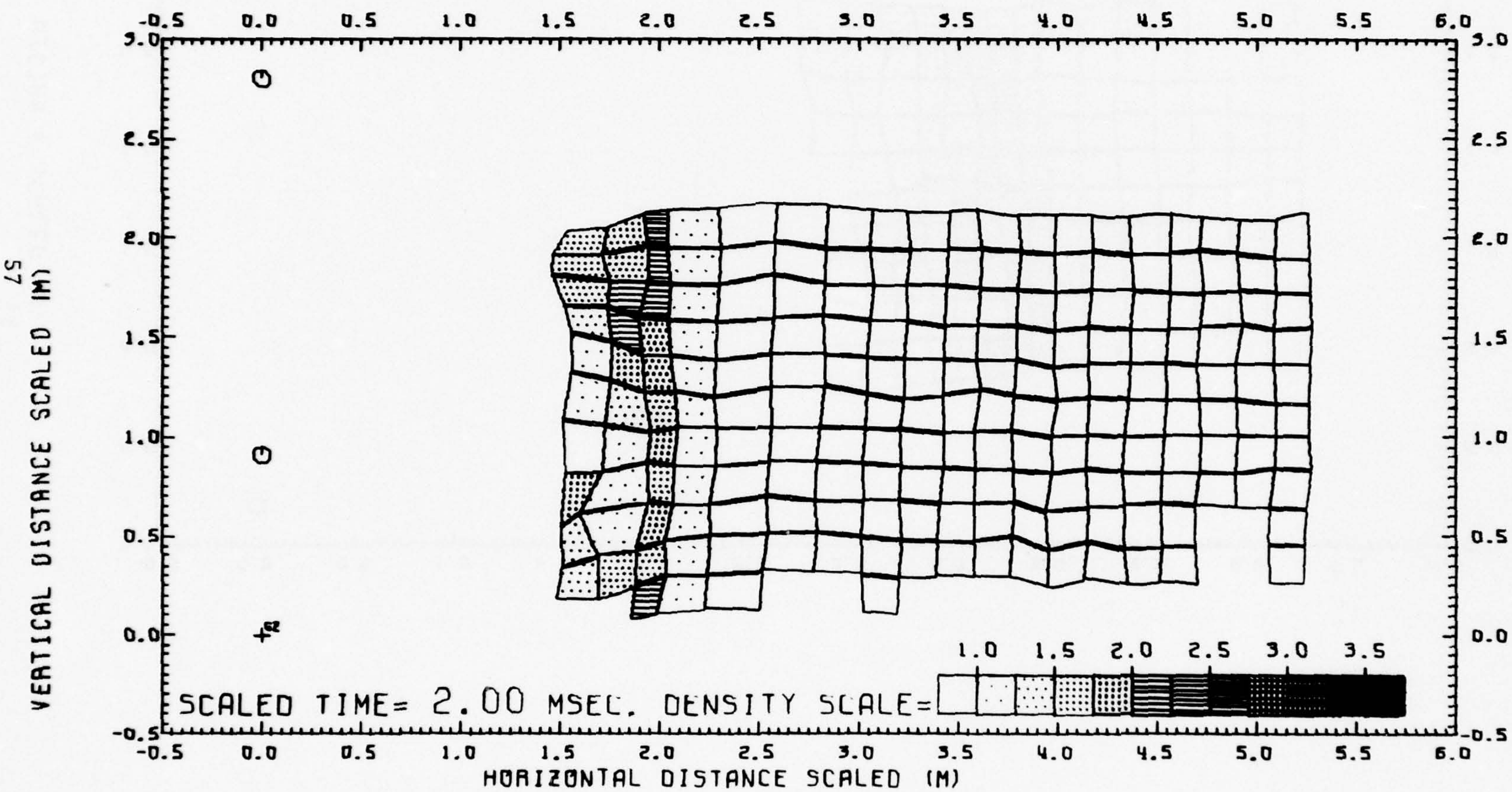


Fig. 13.2 DENSITY FIELD, DIPOLE WEST/11

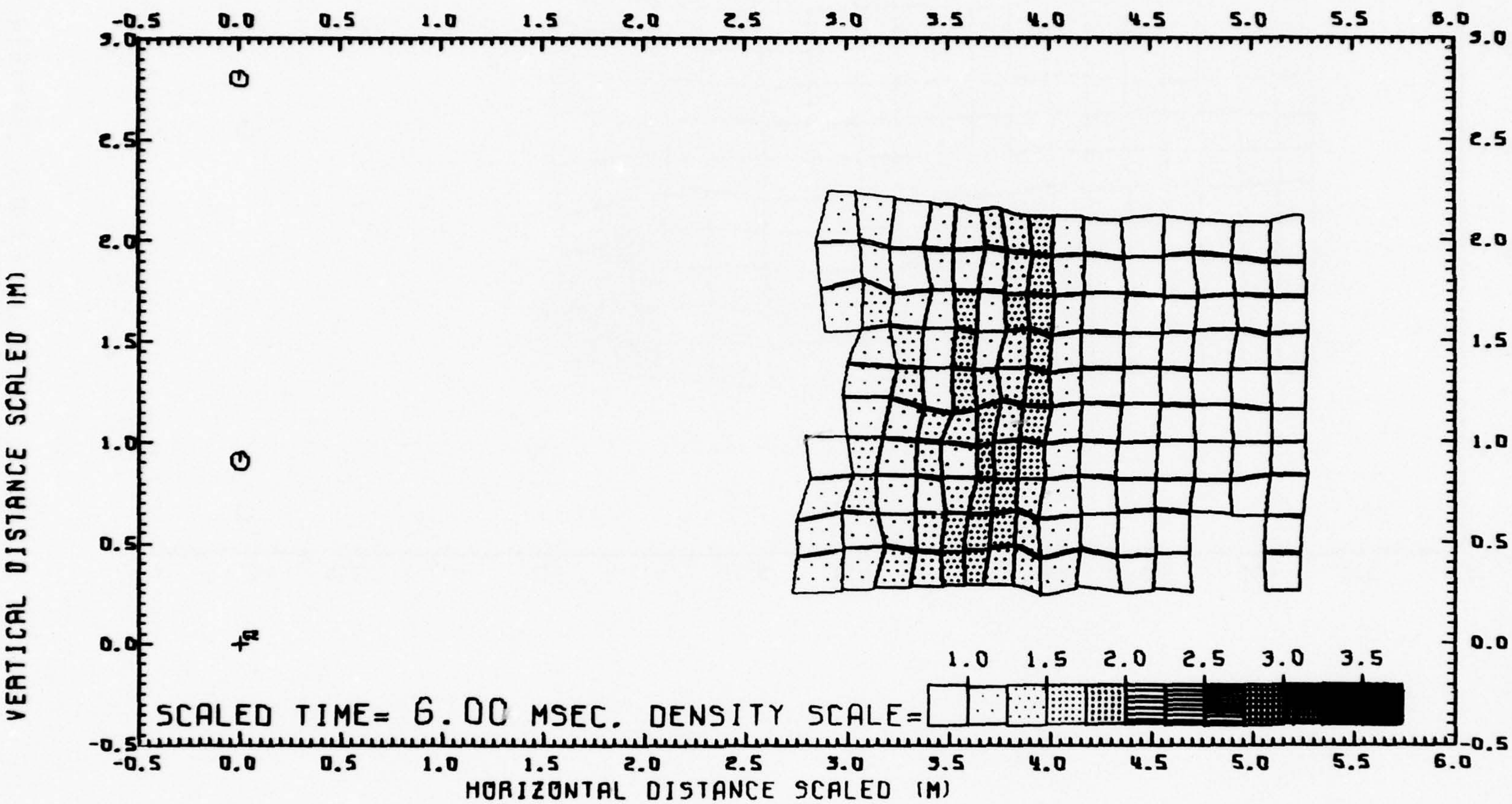


Fig. 13.3 DENSITY FIELD, DIPOLE WEST/11

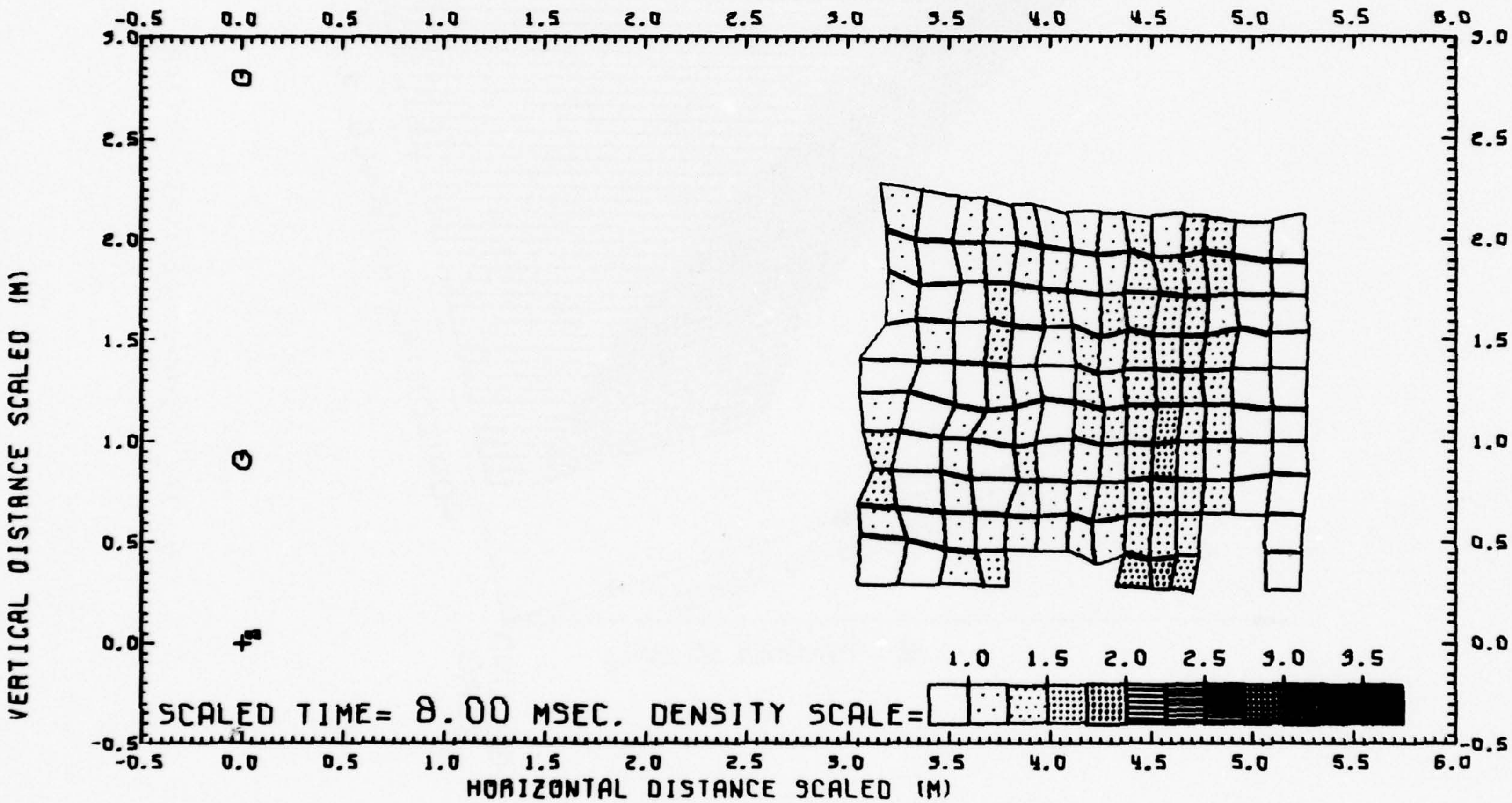


Fig. 13.4 DENSITY FIELD, DIPOLE WEST/11

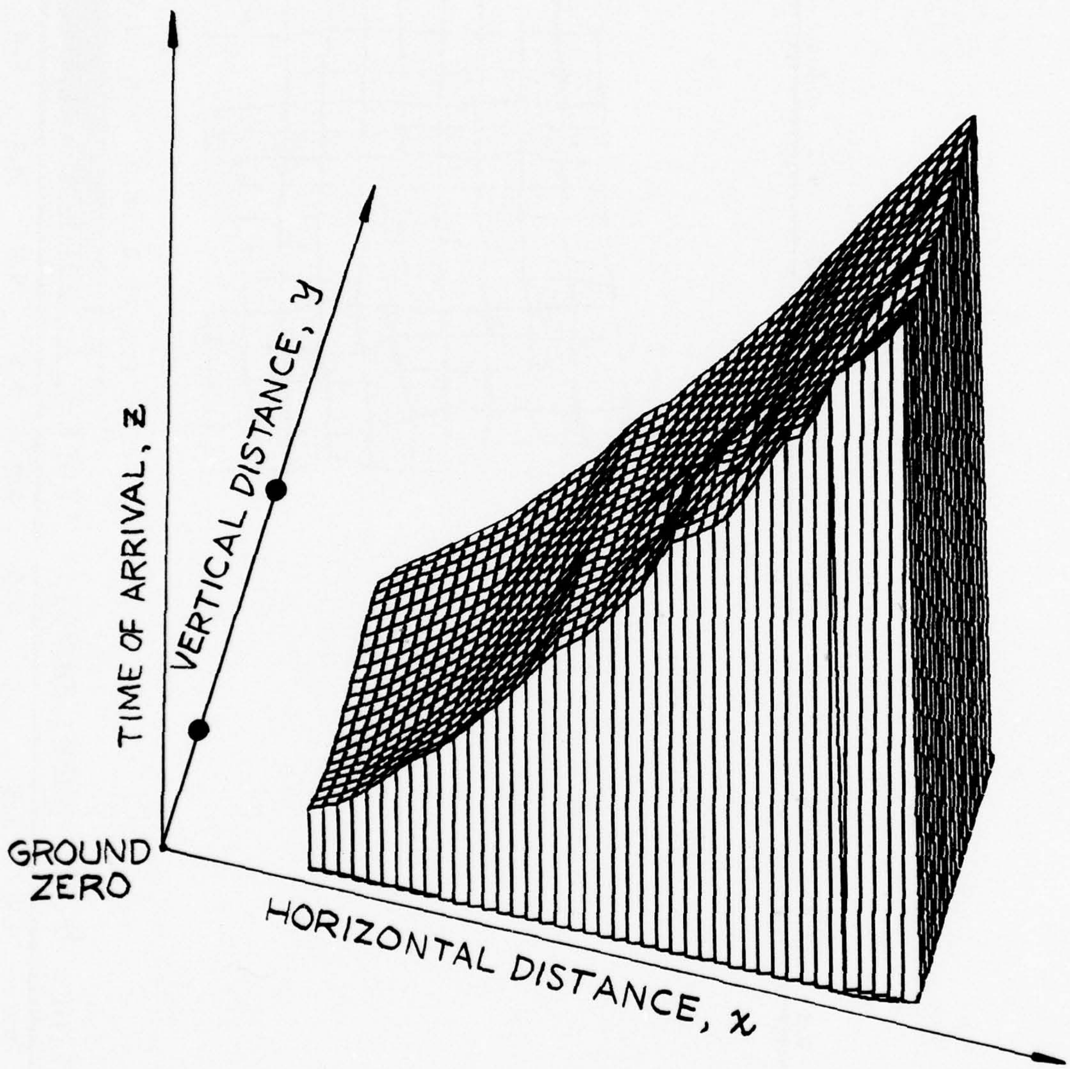


Fig. 14   Time-of-arrival surface

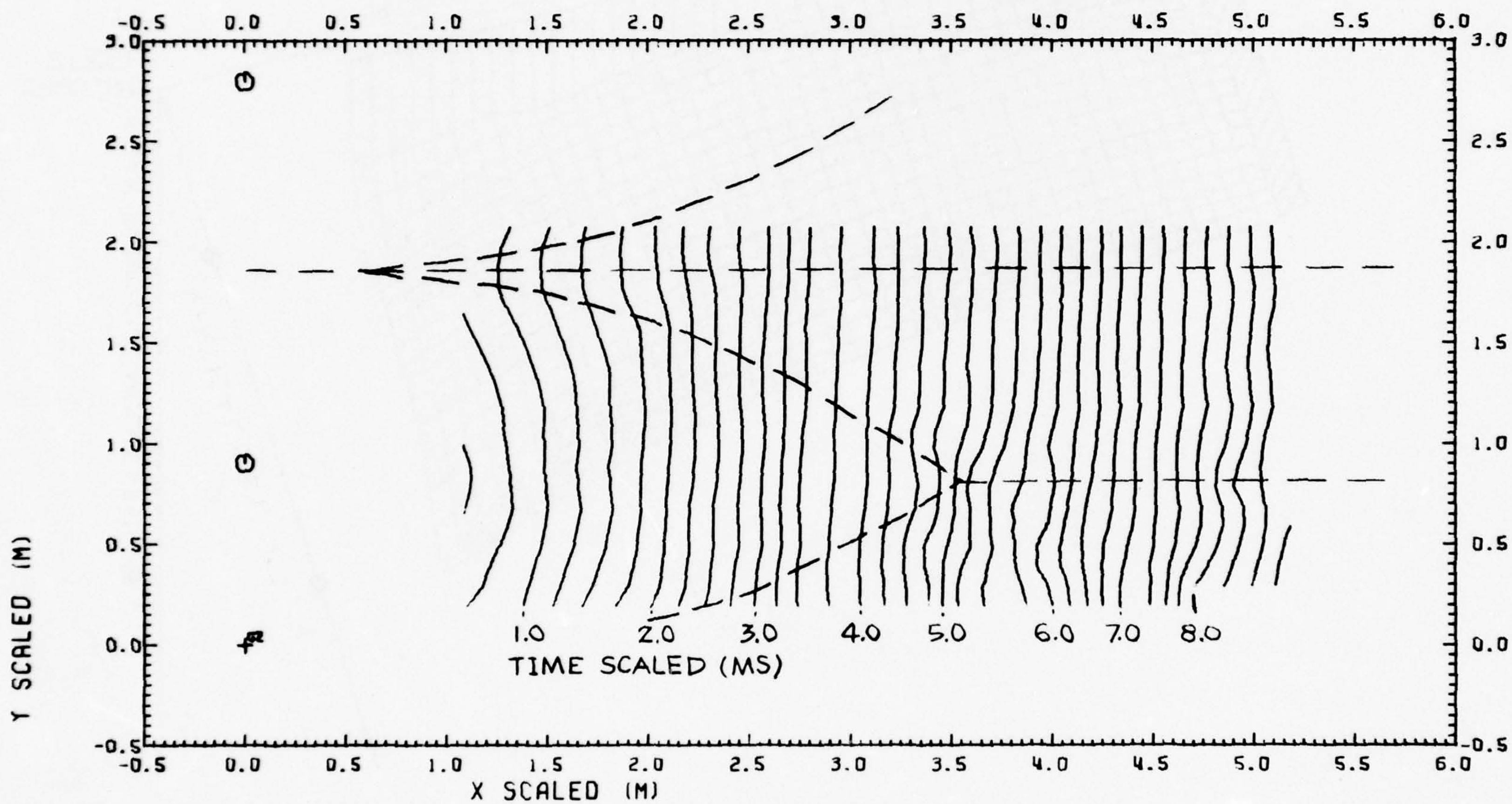


Fig. 15 SHOCK FRONT SHAPES, DIPOLE WEST/11

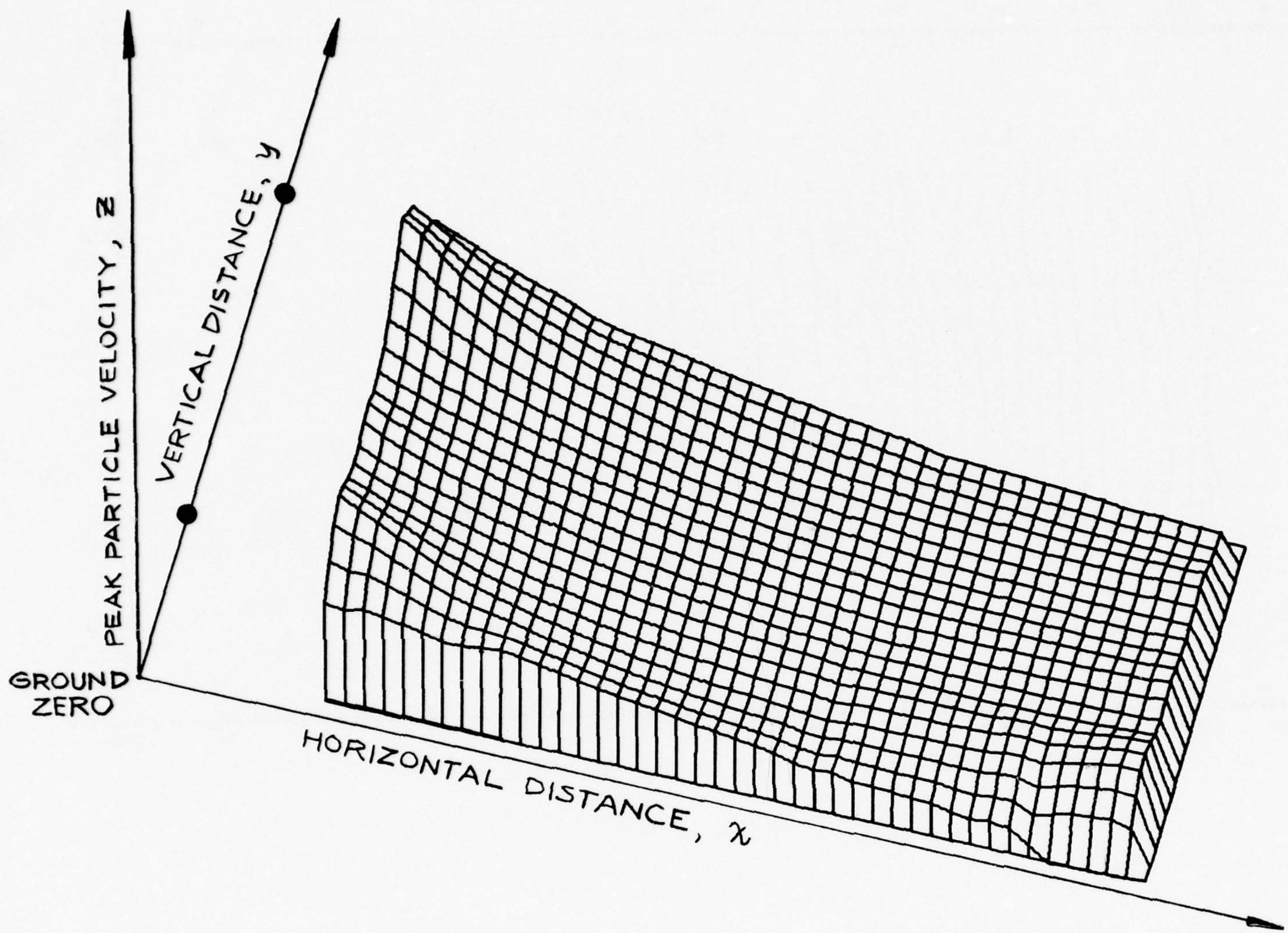


Fig. 16 A shock strength surface

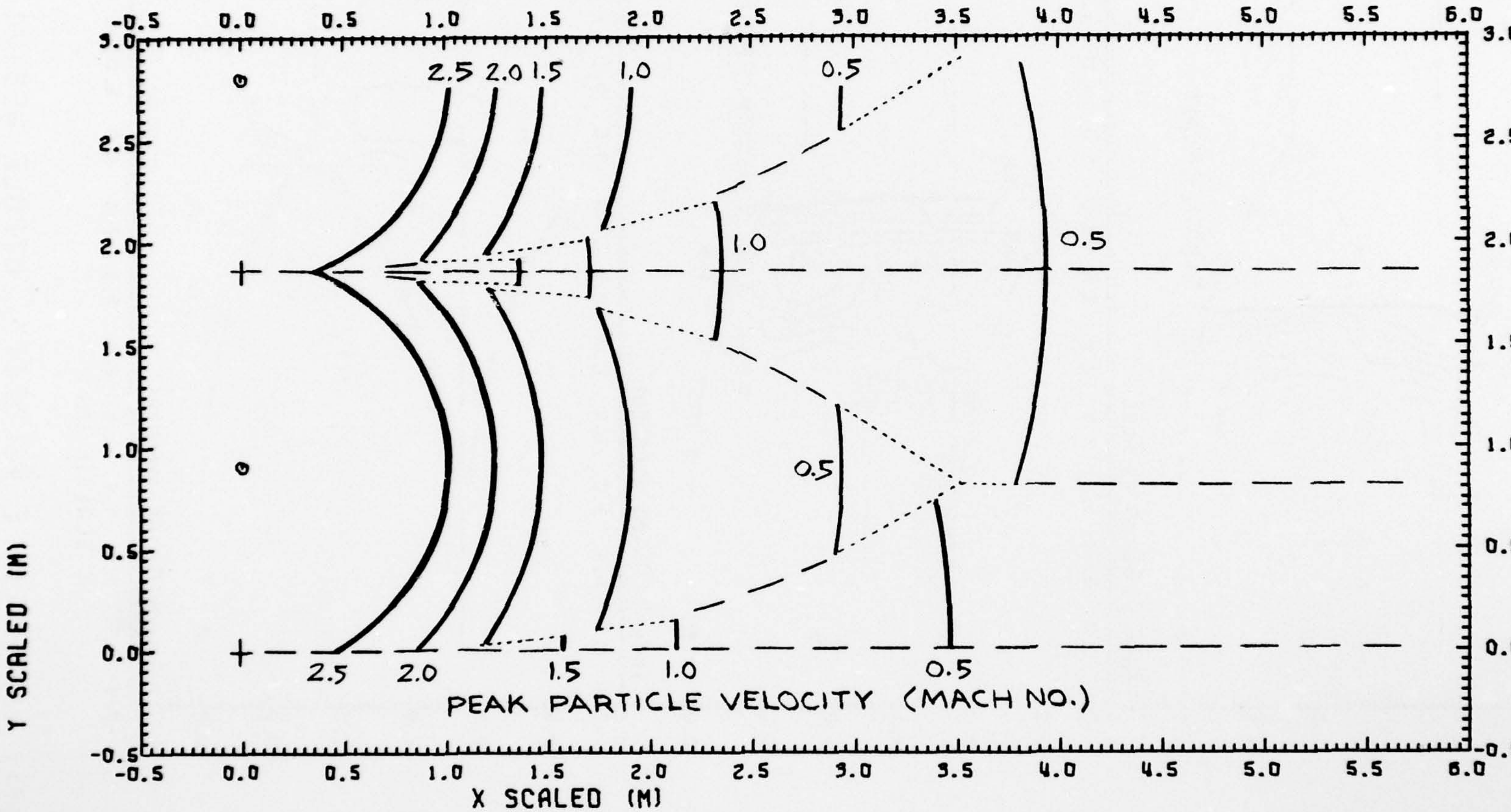


Fig. 17 SHOCK STRENGTH CONTOURS, DIPOLE WEST/11

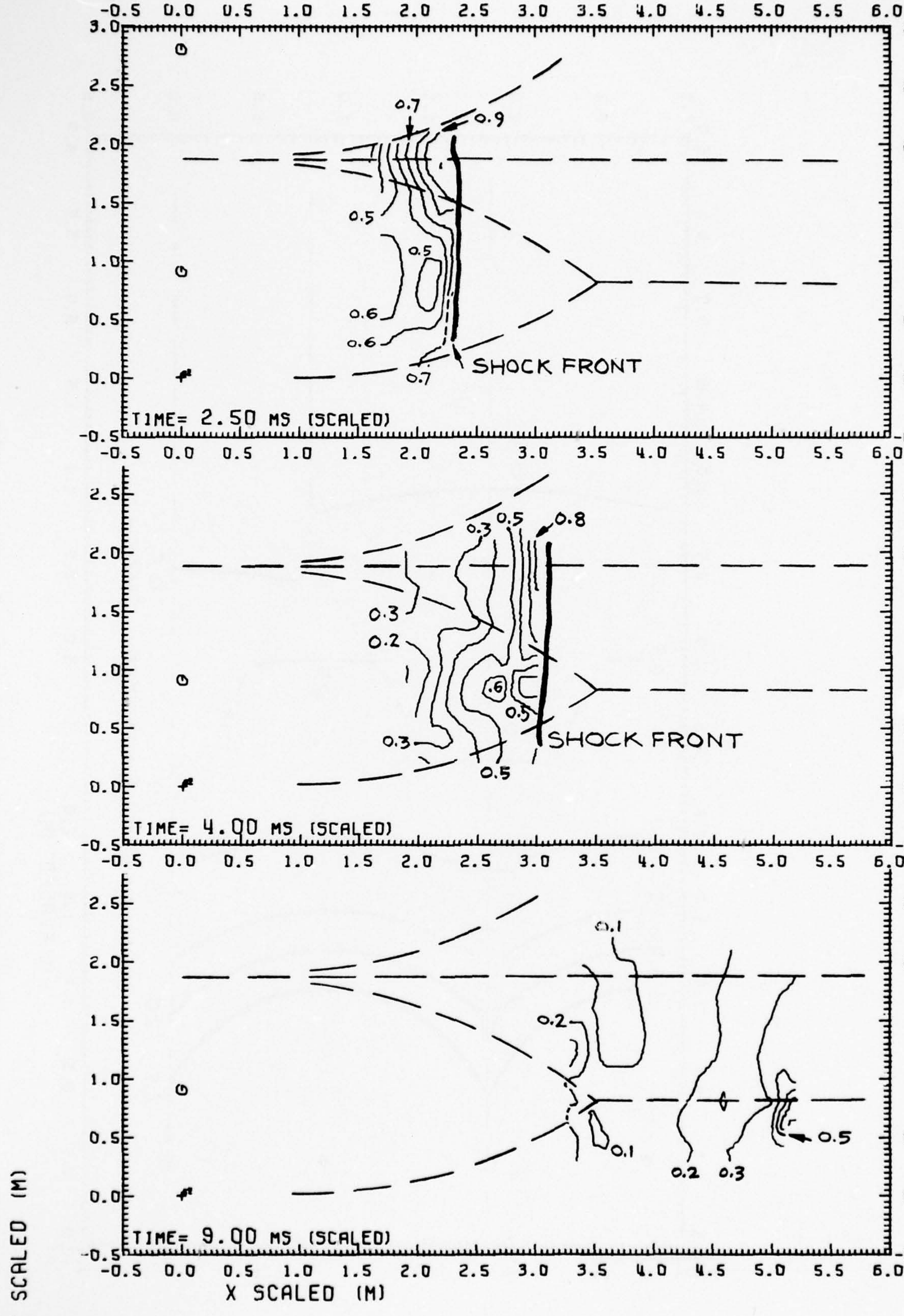


Fig. 18 PARTICLE VELOCITY, DIPOLE WEST/11

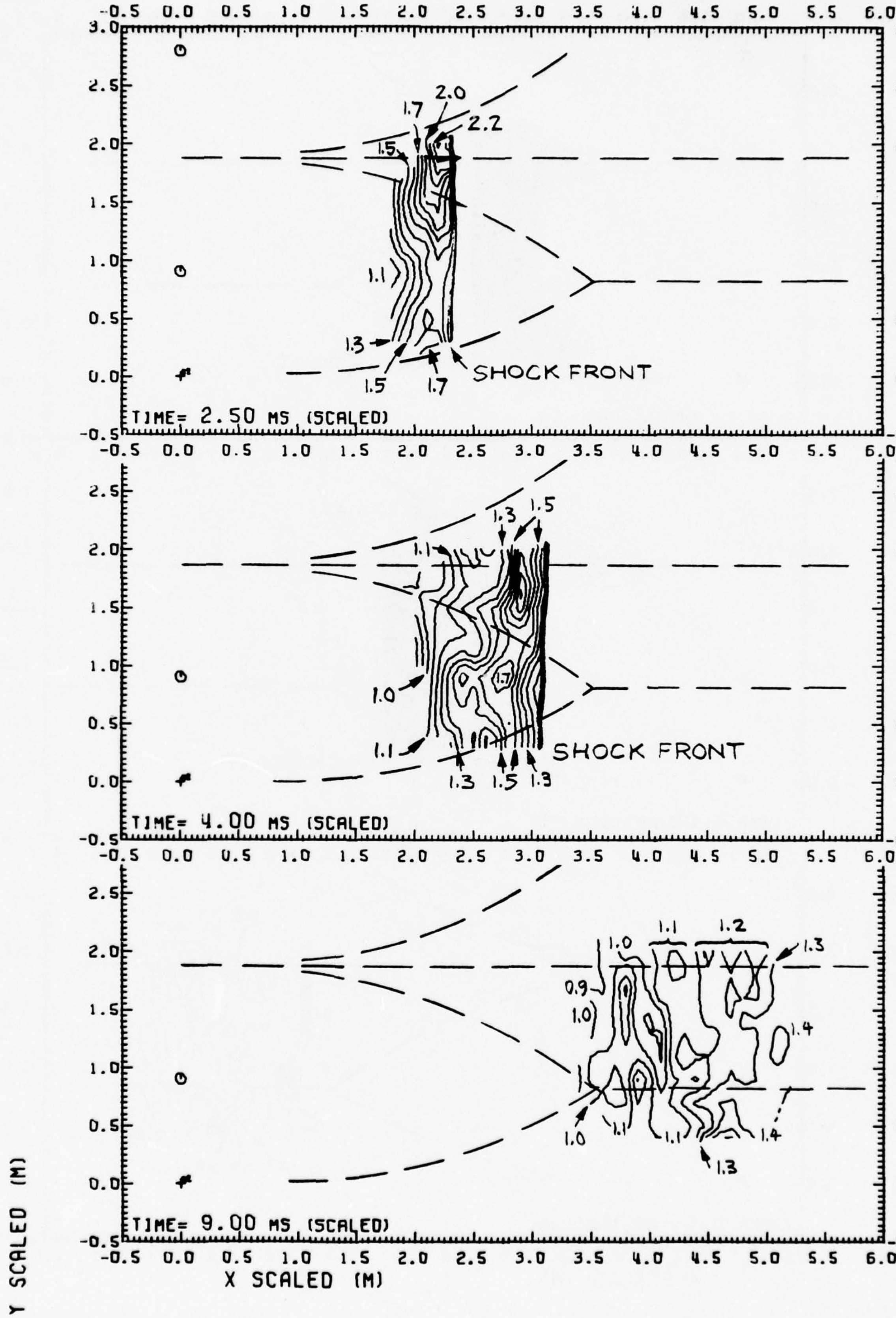


Fig. 19 DENSITY, DIPOLE WEST/11

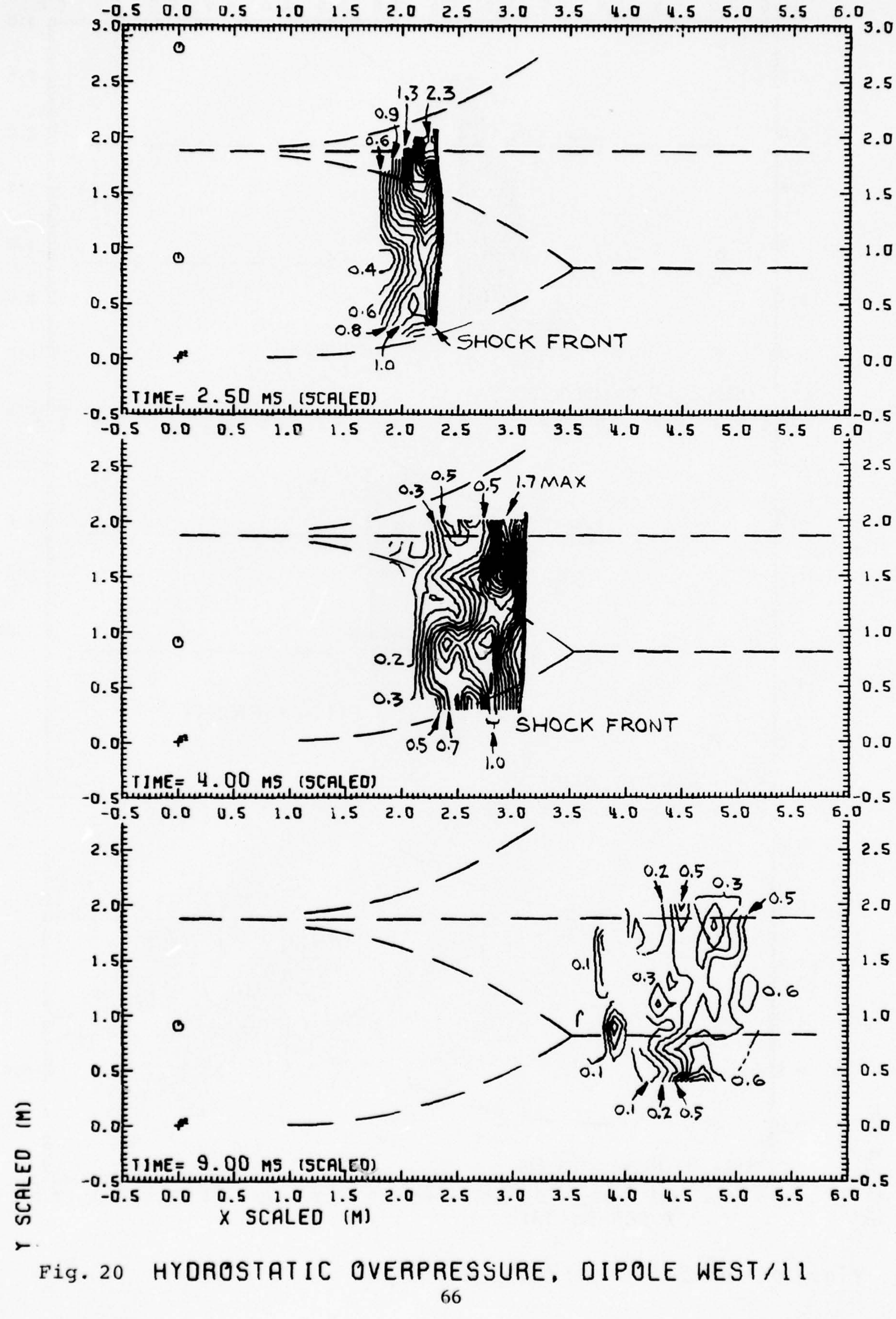


Fig. 20 HYDROSTATIC OVERPRESSURE, DIPOLE WEST/11

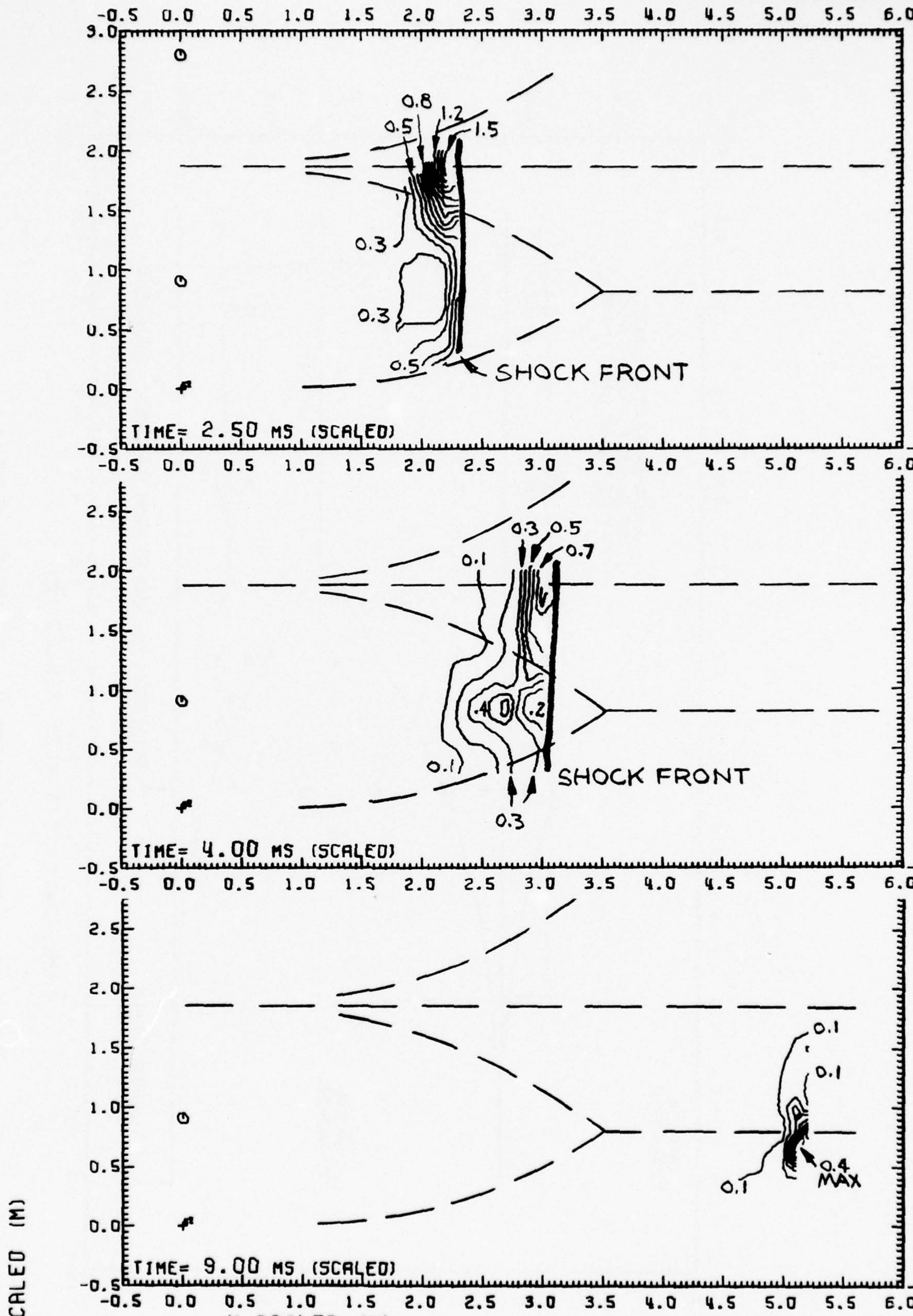


Fig. 21 DYNAMIC PRESSURE, DIPOLE WEST/11

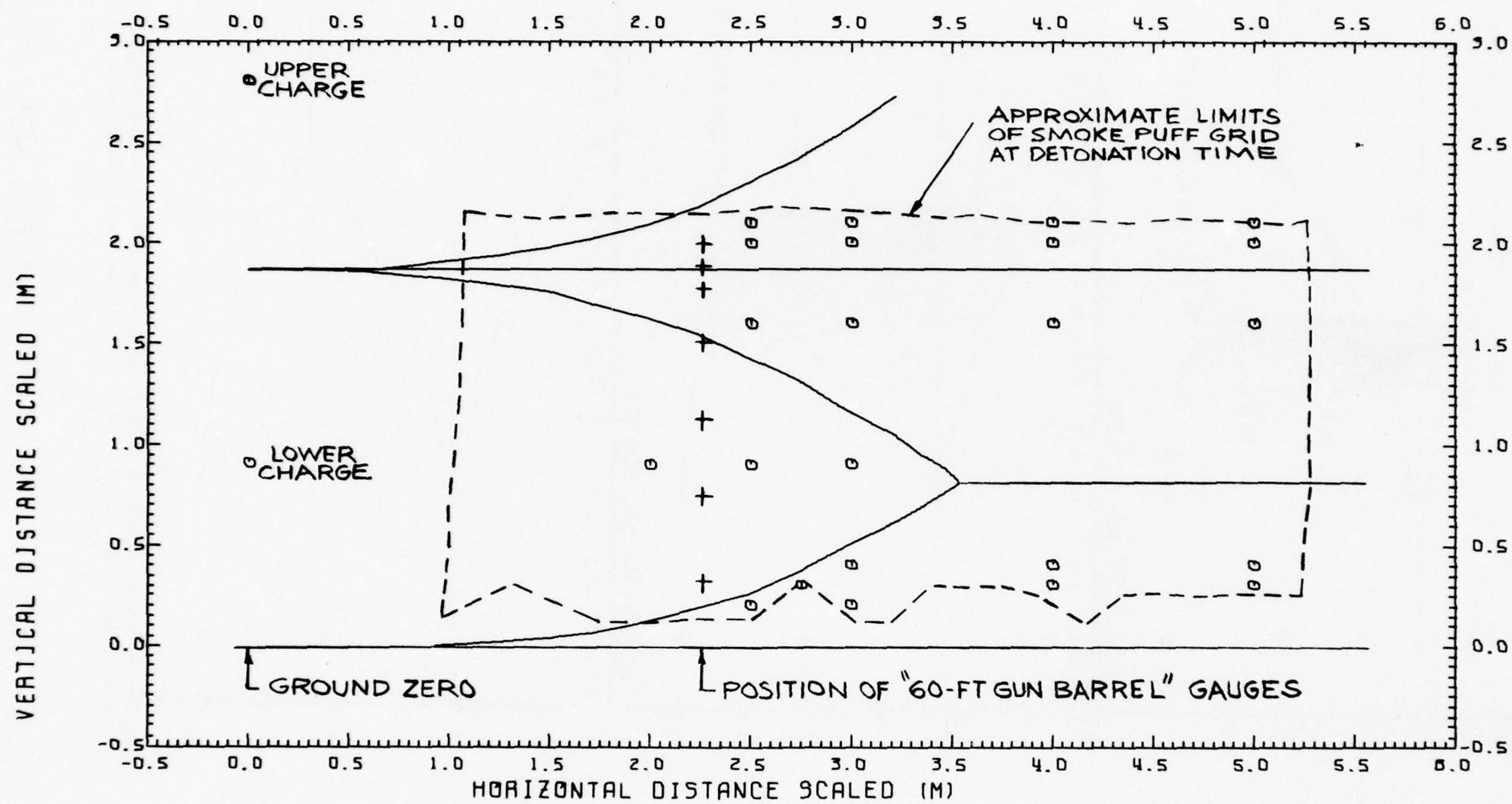


Fig. 22 TIME HISTORY STATIONS, DIPOLE WEST/11

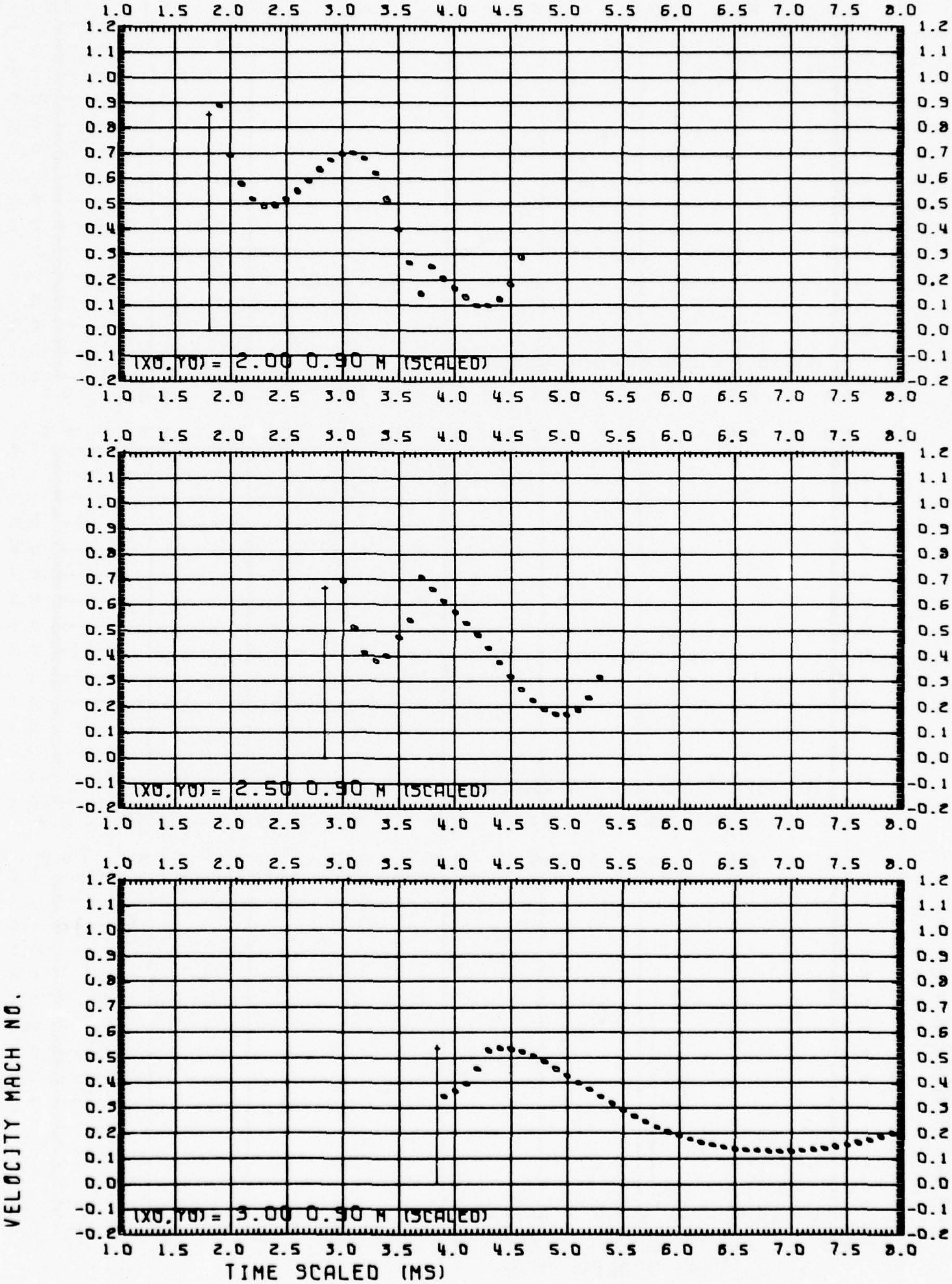


Fig. 23.1 PARTICLE VELOCITY, DIPOLE WEST/11

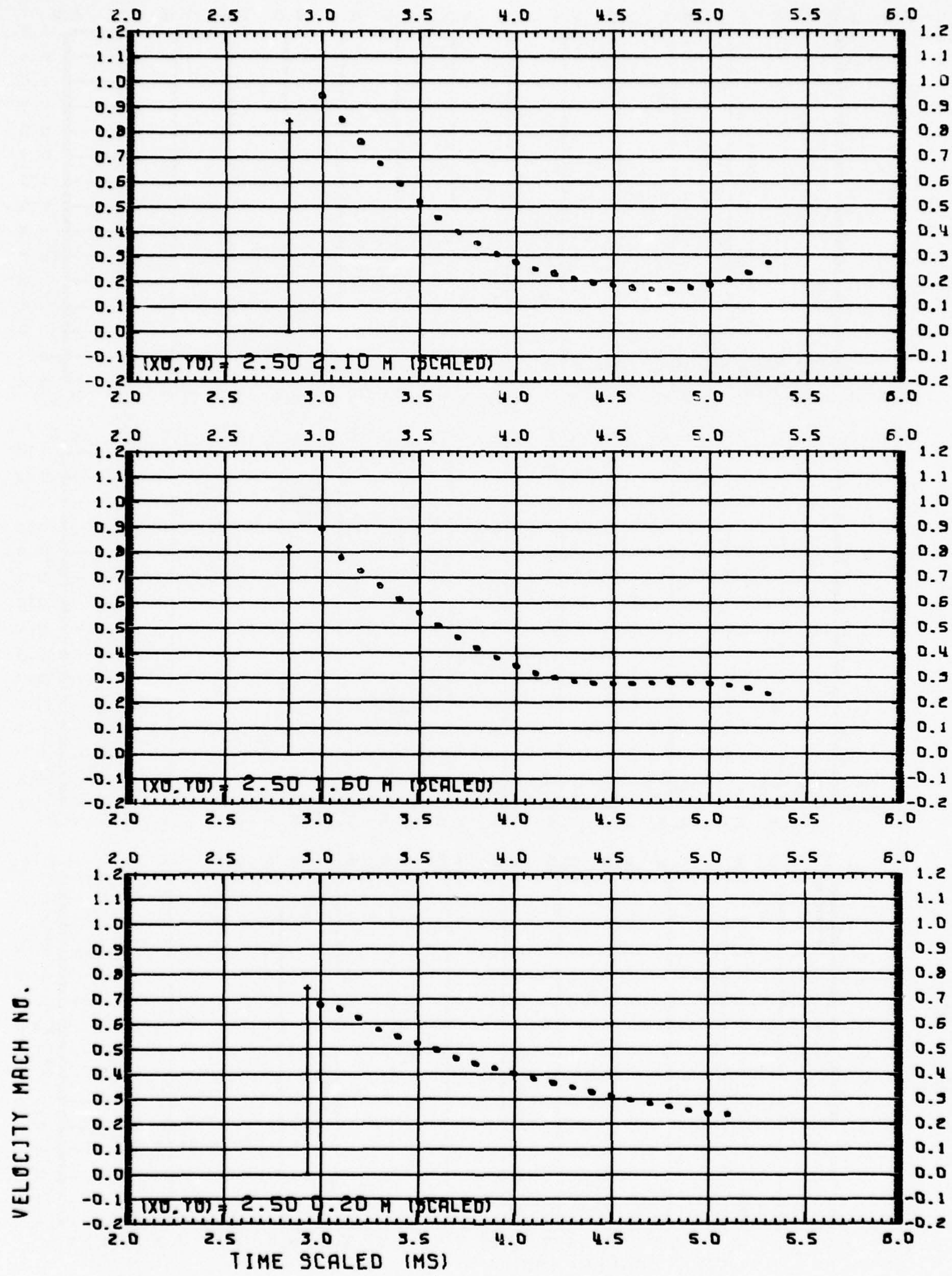


Fig. 23.2 PARTICLE VELOCITY, DIPOLE WEST/11

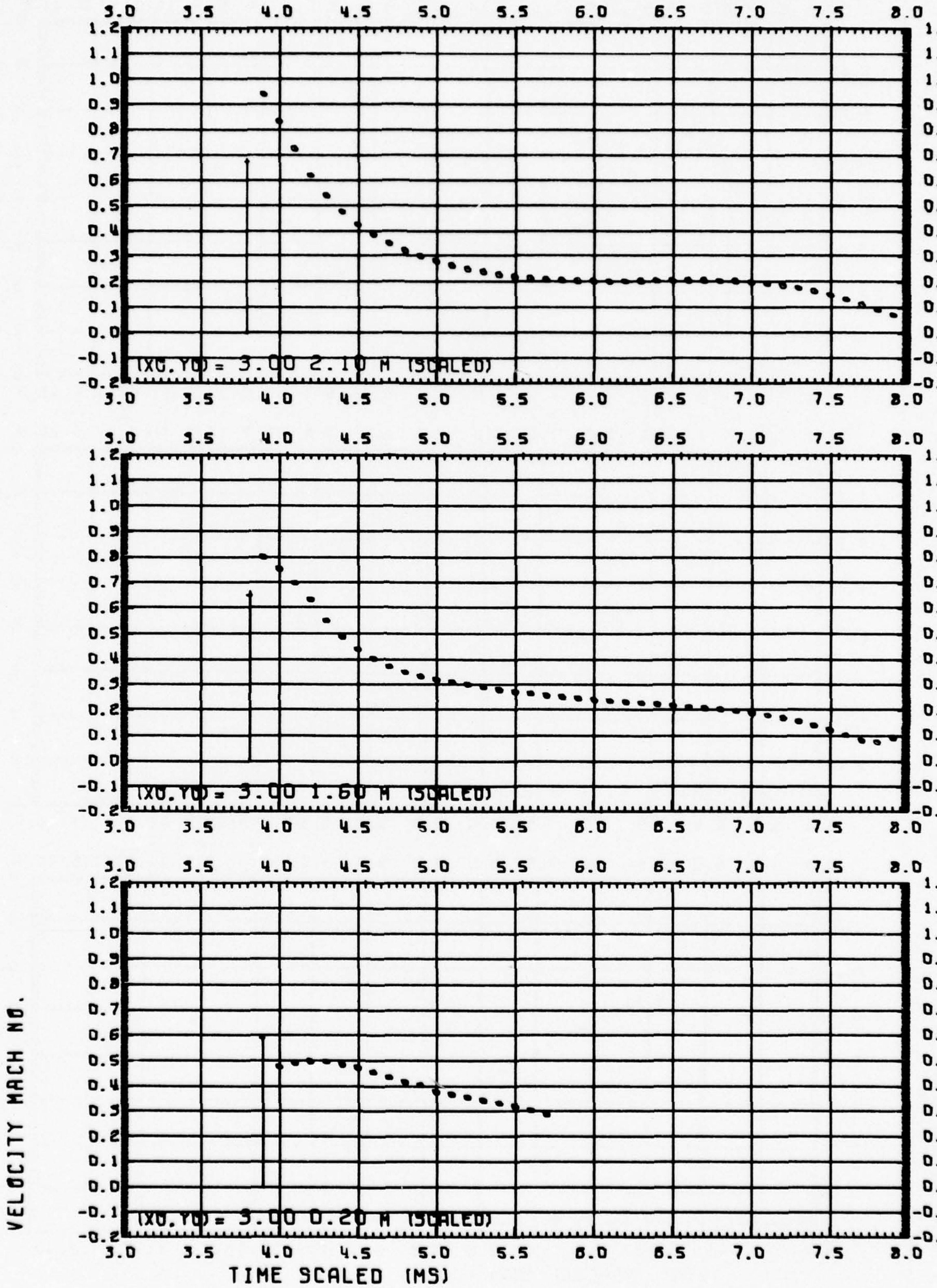


Fig. 23.3 PARTICLE VELOCITY, DIPOLE WEST/11

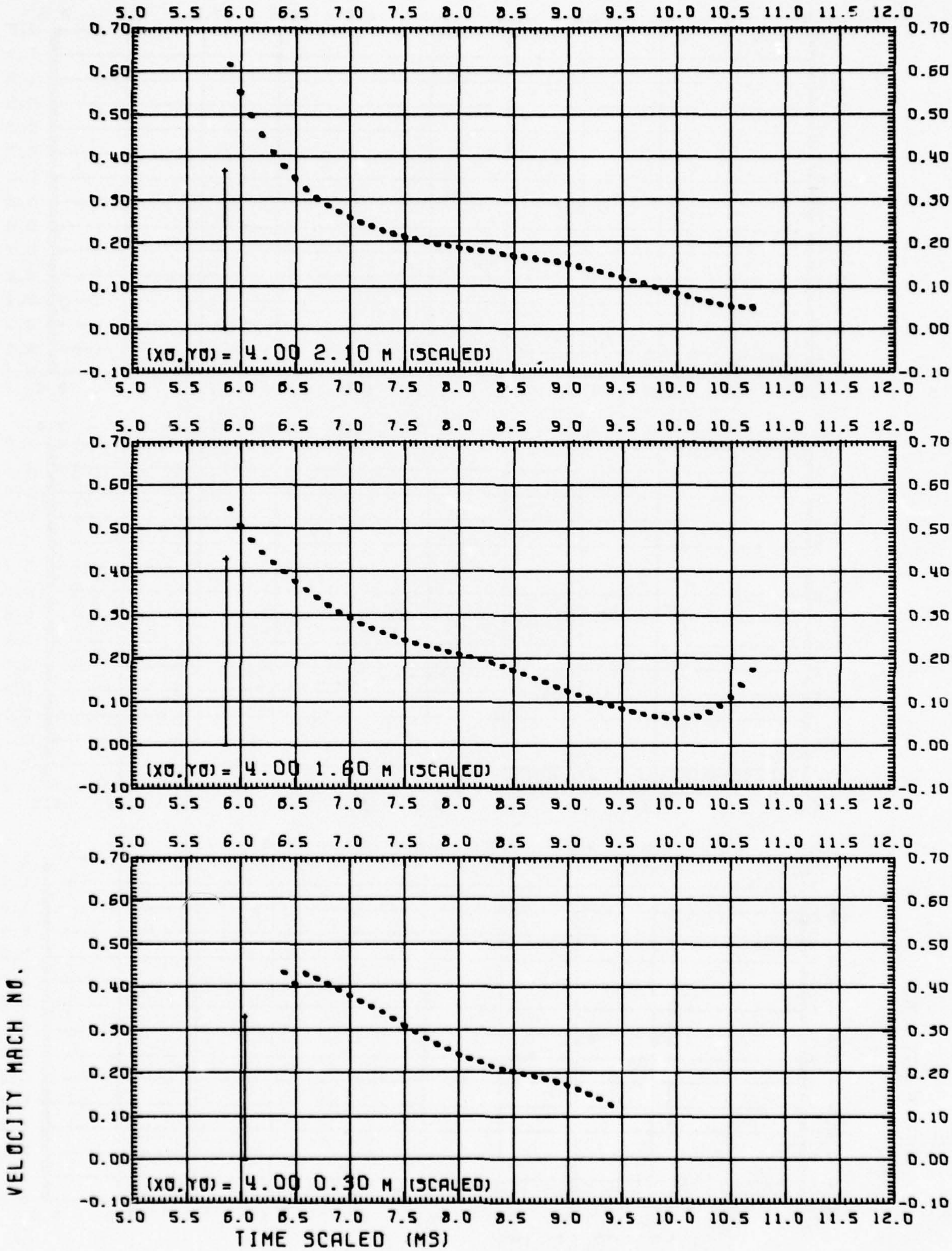


Fig. 23.4 PARTICLE VELOCITY, DIPOLE WEST/11

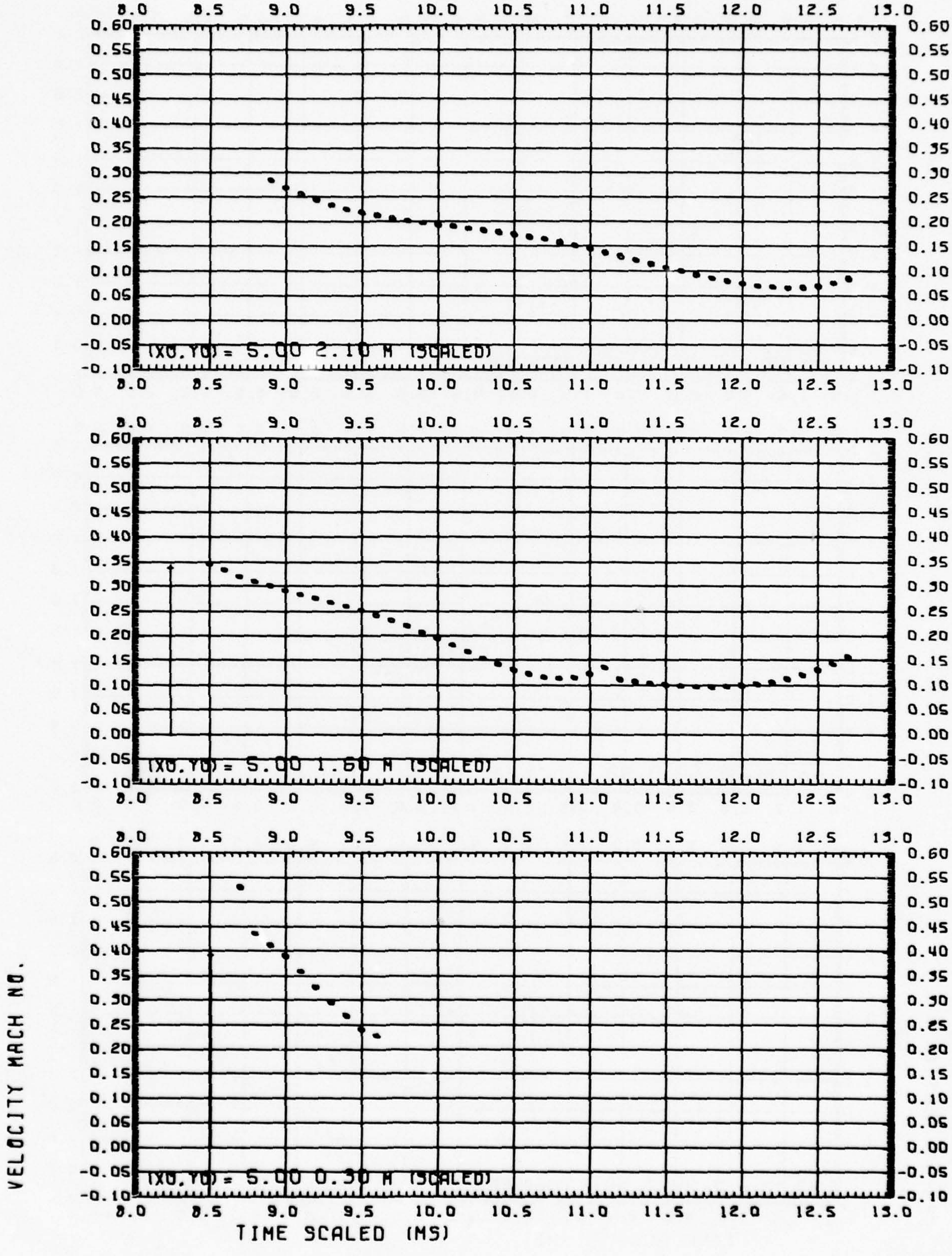


Fig. 23.5 PARTICLE VELOCITY, DIPOLE WEST/11

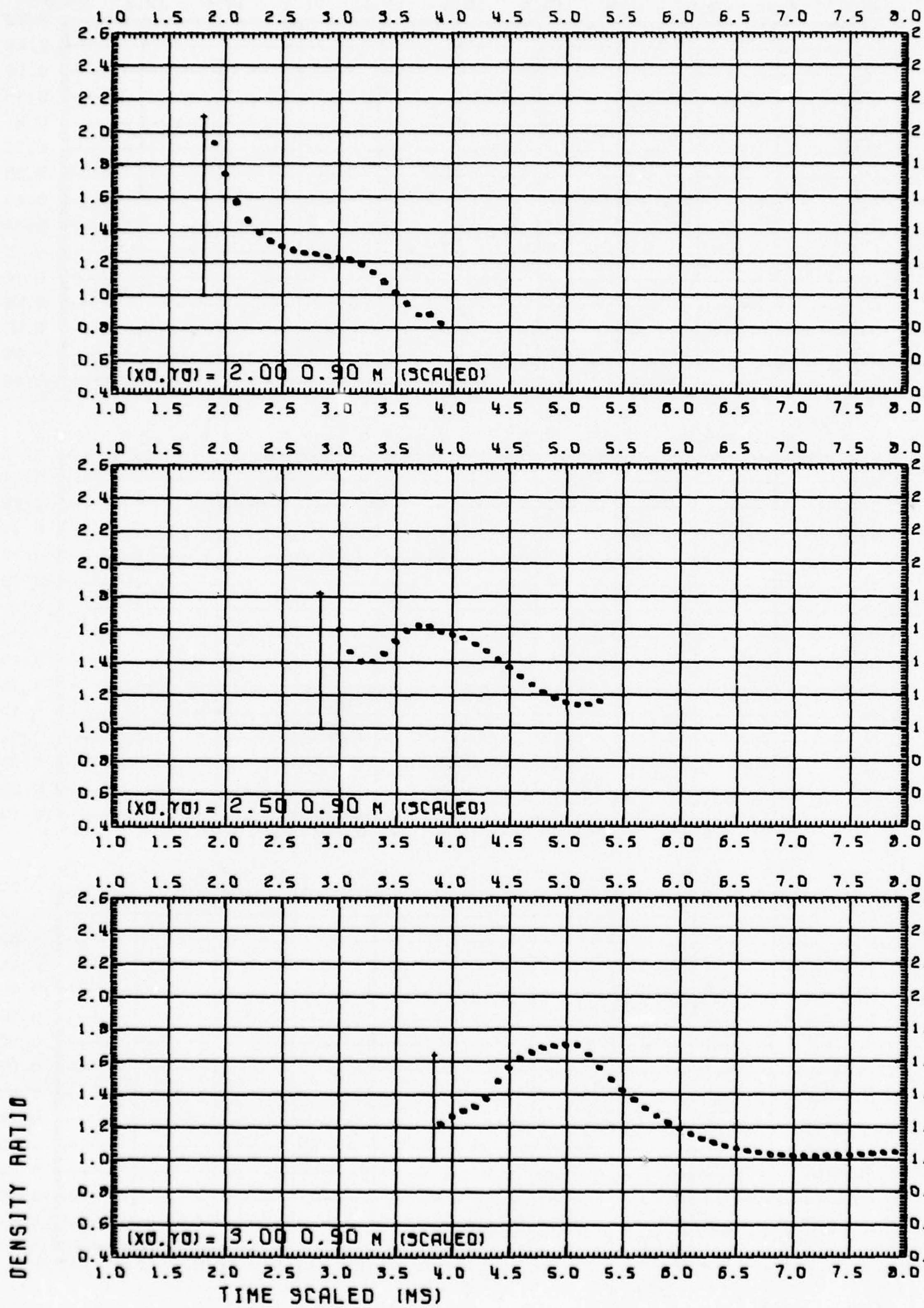


Fig. 24.1 DENSITY, DIPOLE WEST/11

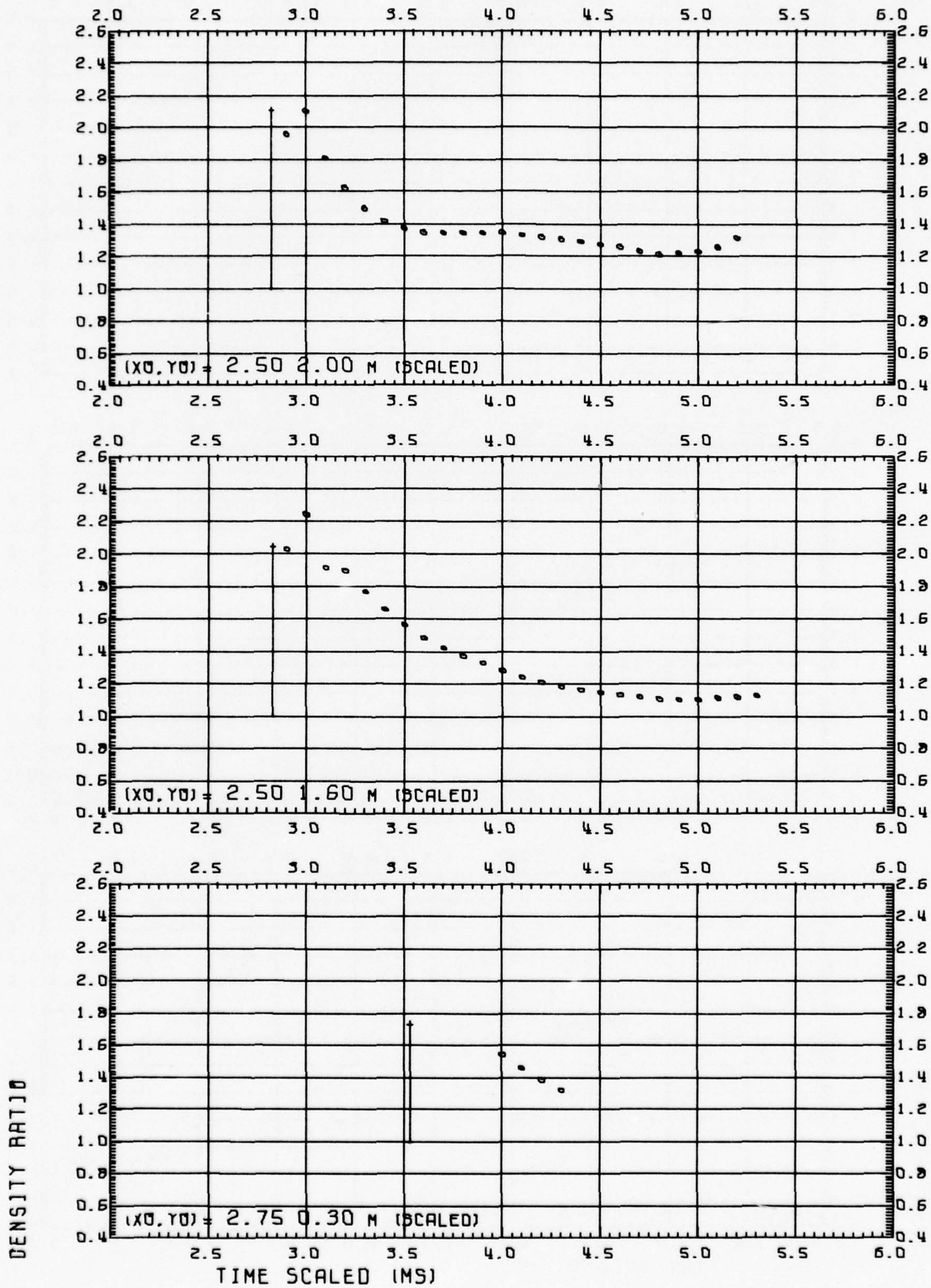


Fig. 24.2 DENSITY, DIPOLE WEST/11

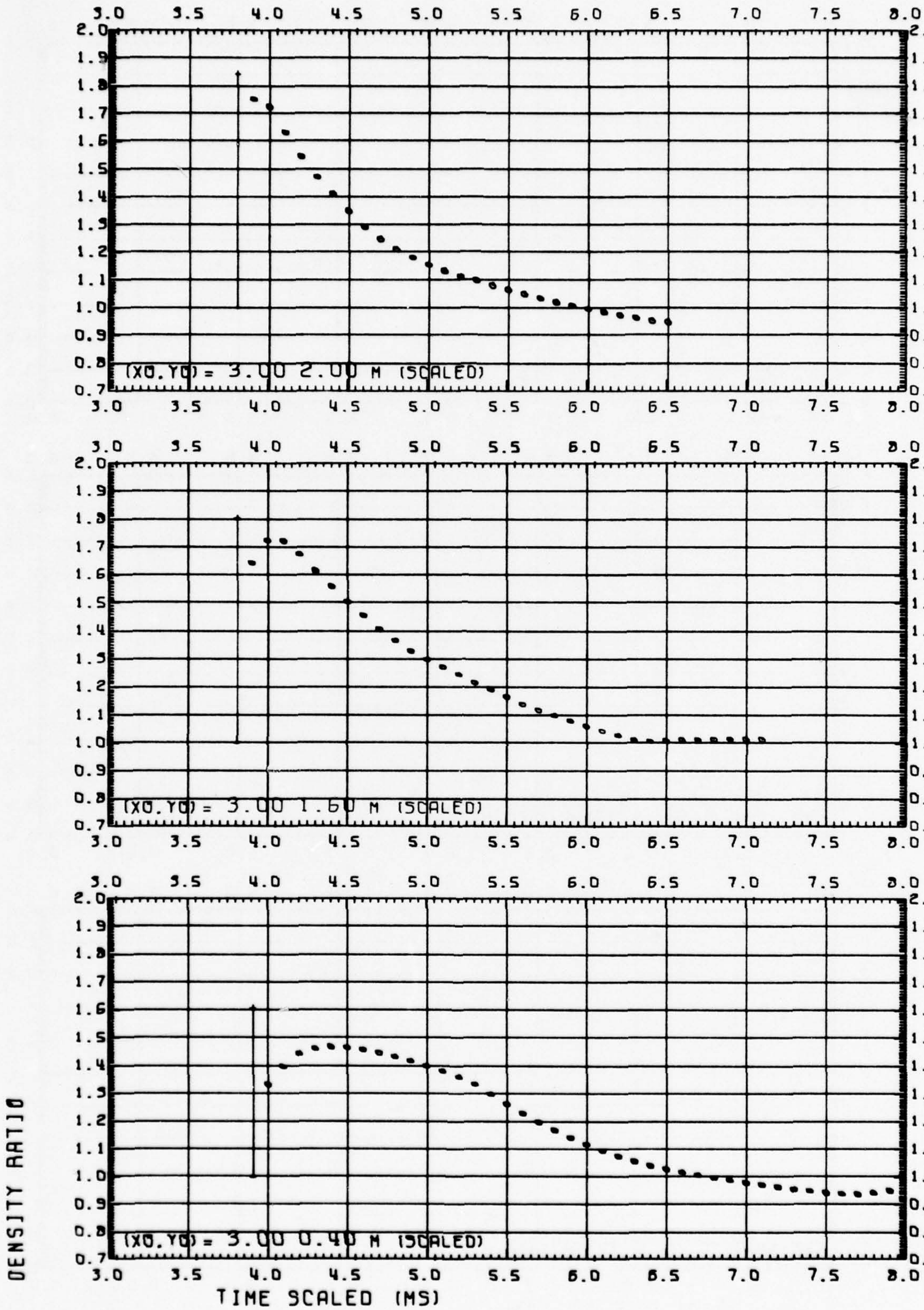


Fig. 24.3 DENSITY, DIPOLE WEST/11

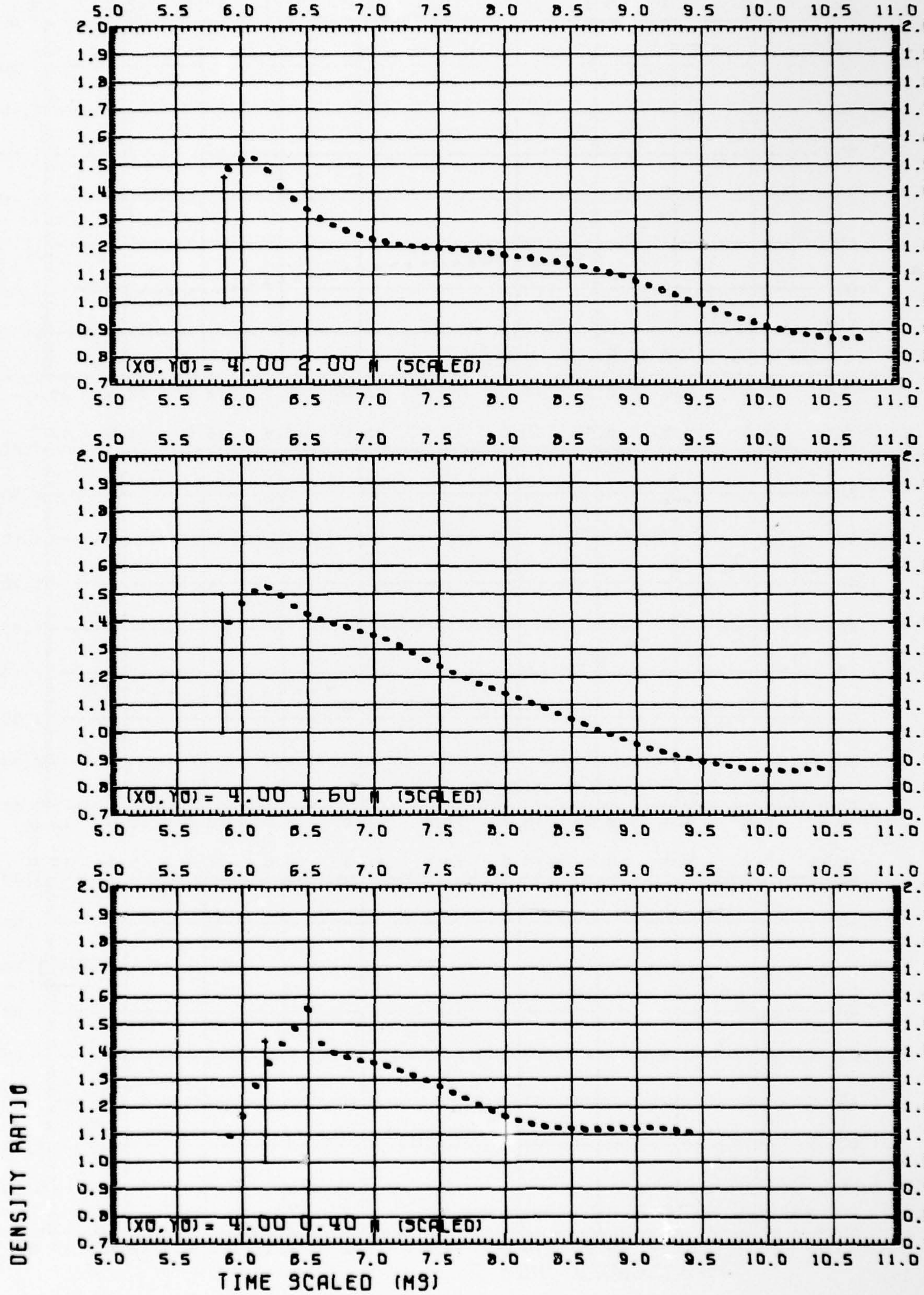


Fig. 24.4 DENSITY, DIPOLE WEST/11

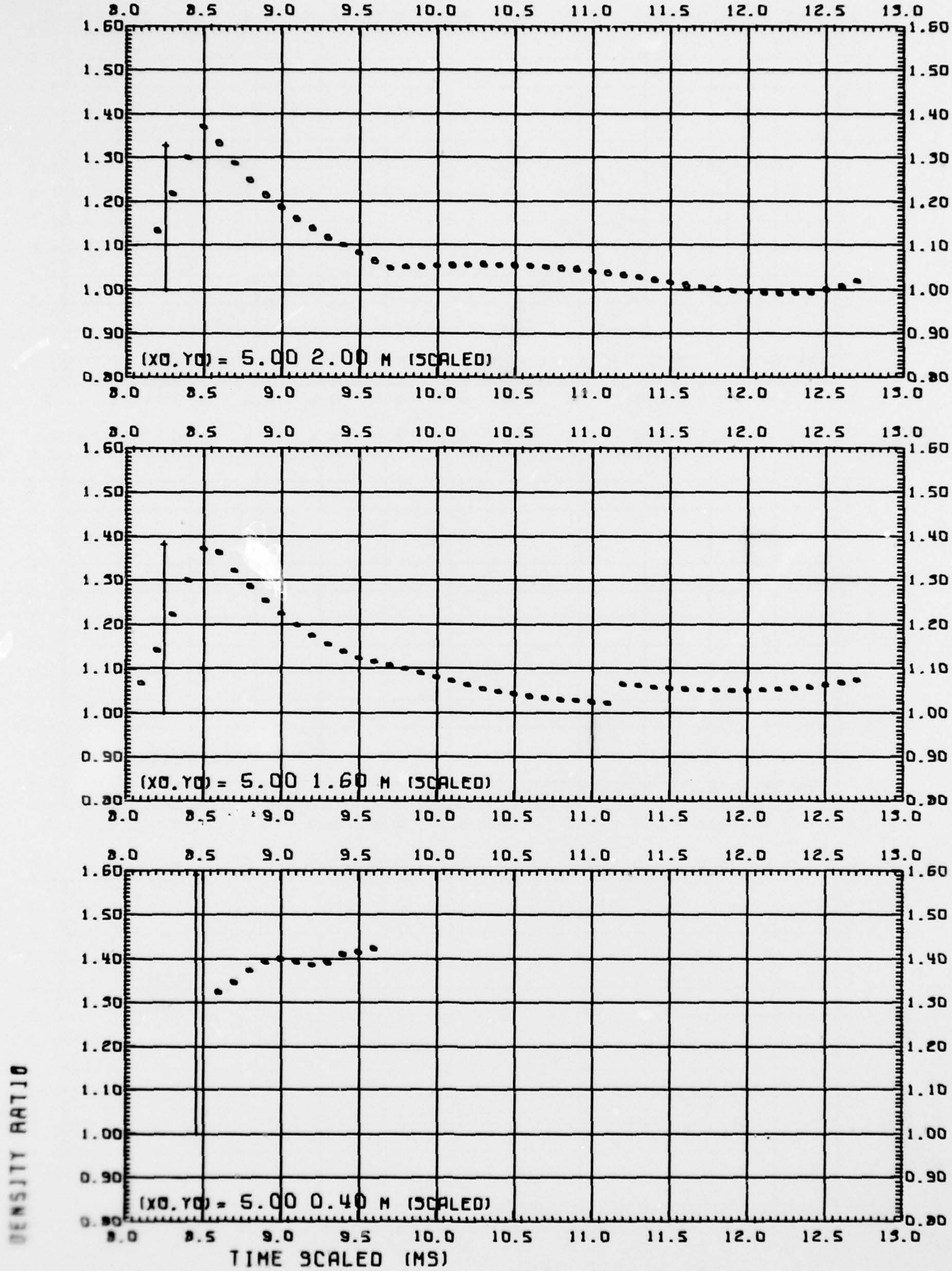


Fig. 24.5 DENSITY, DIPOLE WEST/11

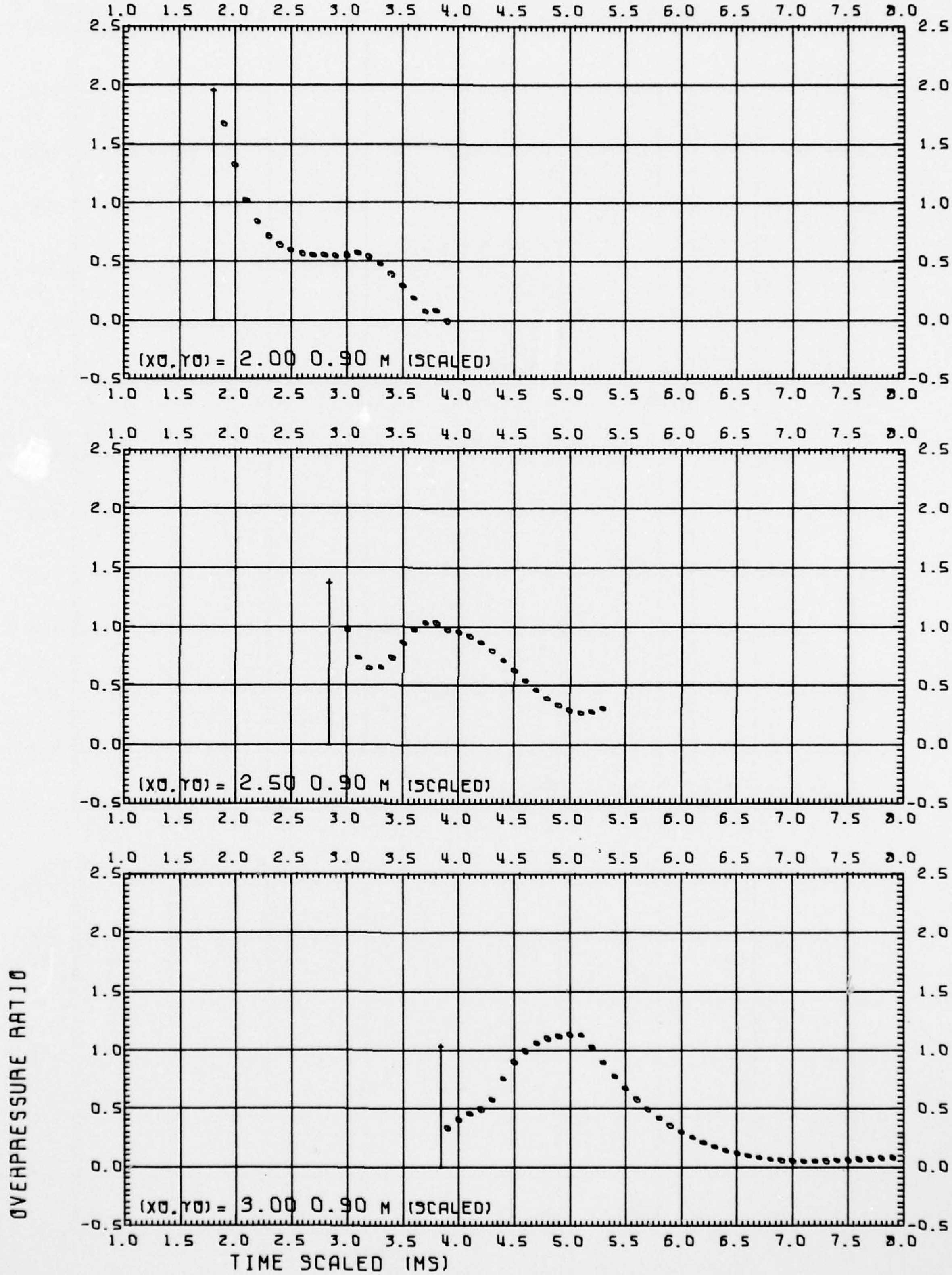


Fig. 25.1 HYDROSTATIC OVERPRESSURE, DIPOLE WEST/11

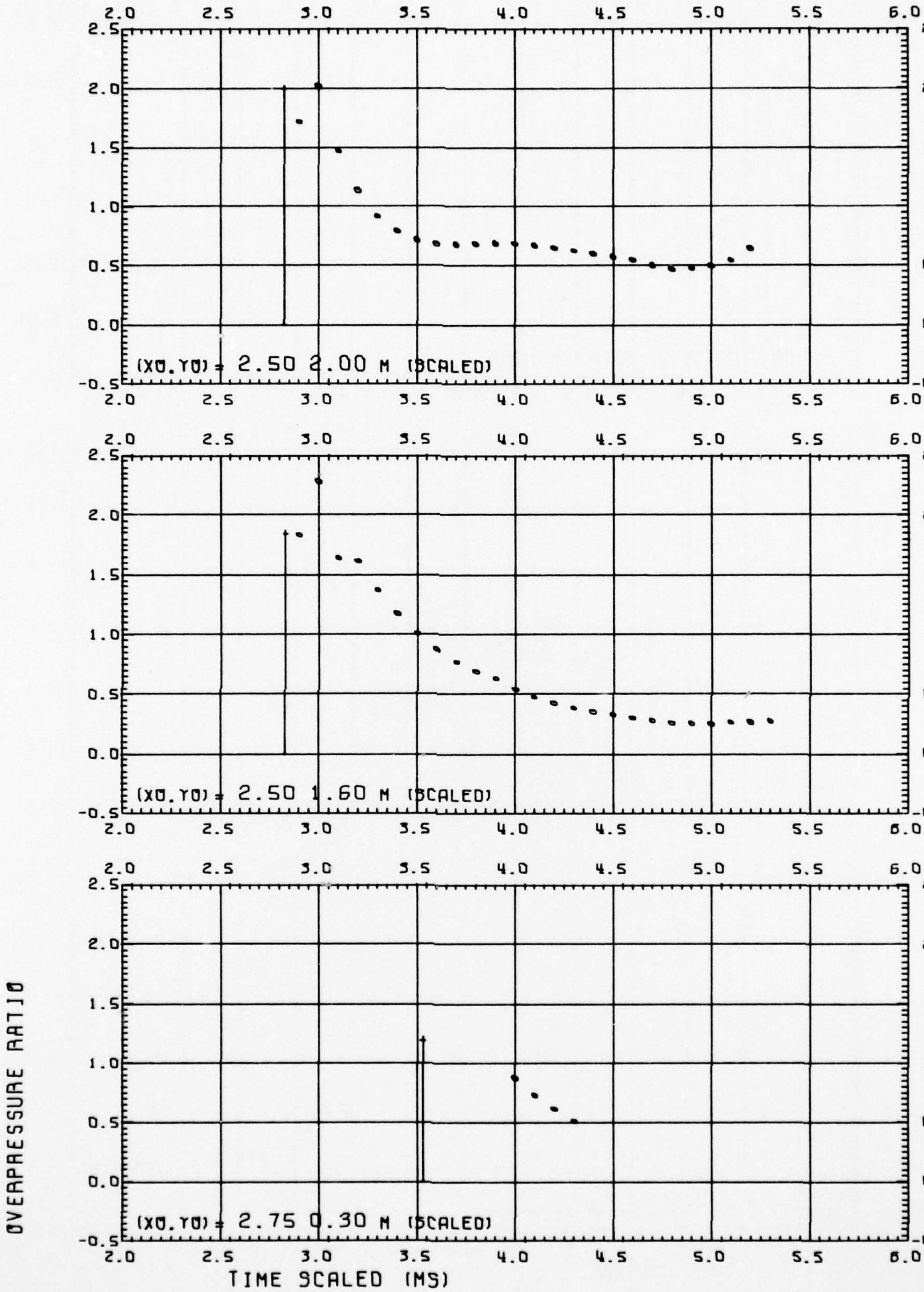


Fig. 25.2 HYDROSTATIC OVERPRESSURE, DIPOLE WEST/11

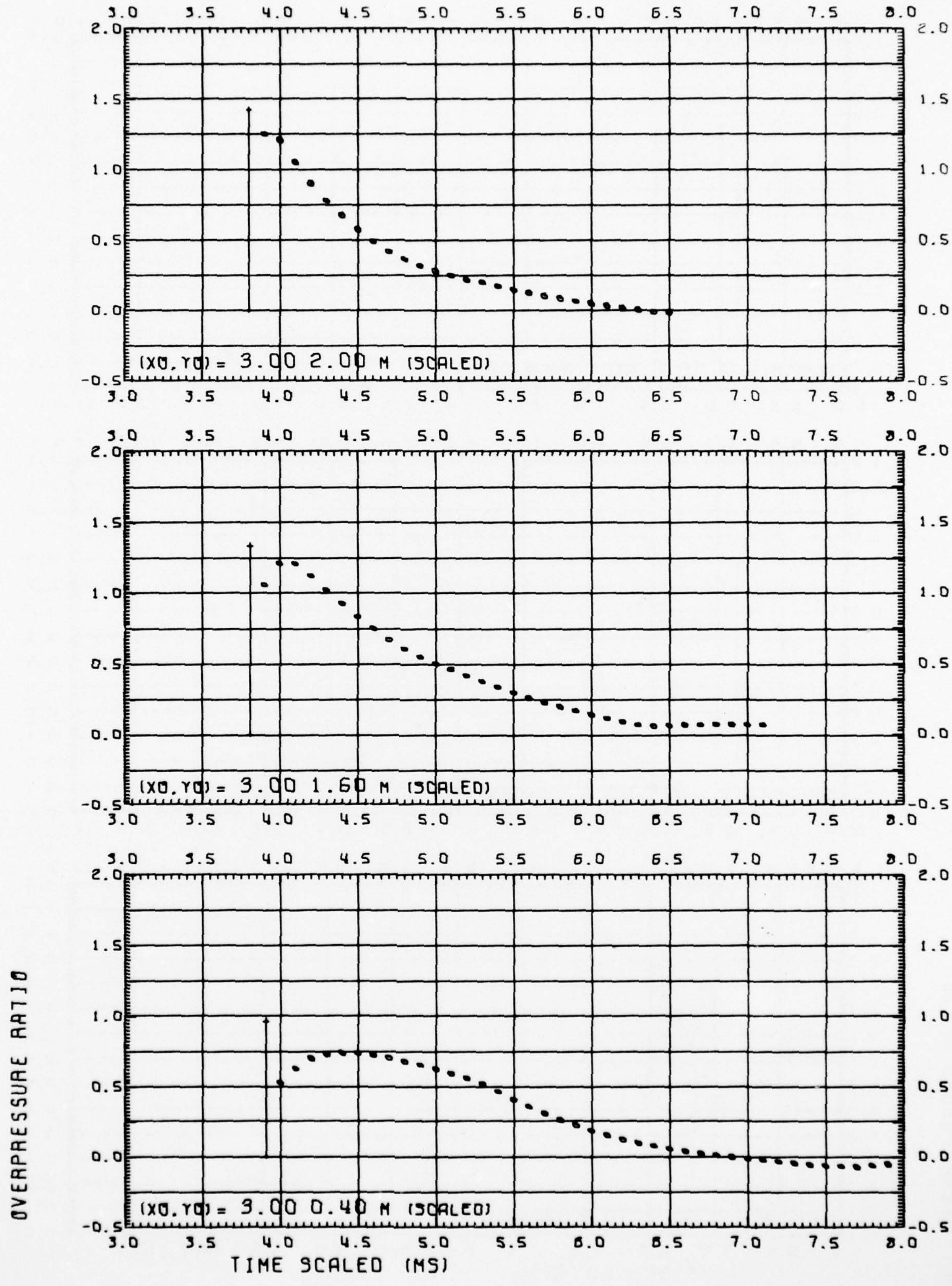


Fig. 25.3 HYDROSTATIC OVERPRESSURE, DIPOLE WEST/11

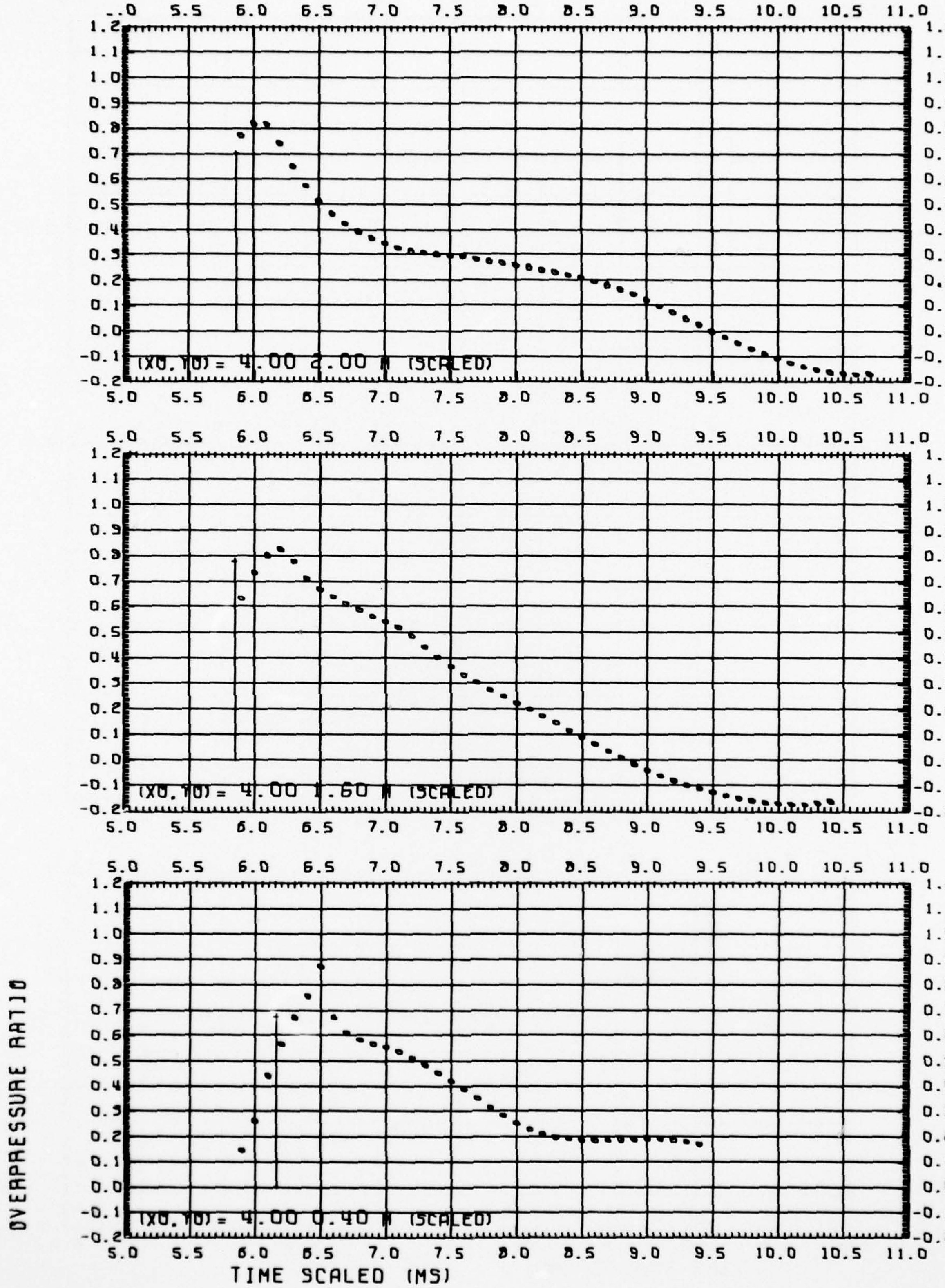


Fig. 25.4 HYDROSTATIC OVERPRESSURE, DIPOLE WEST/11

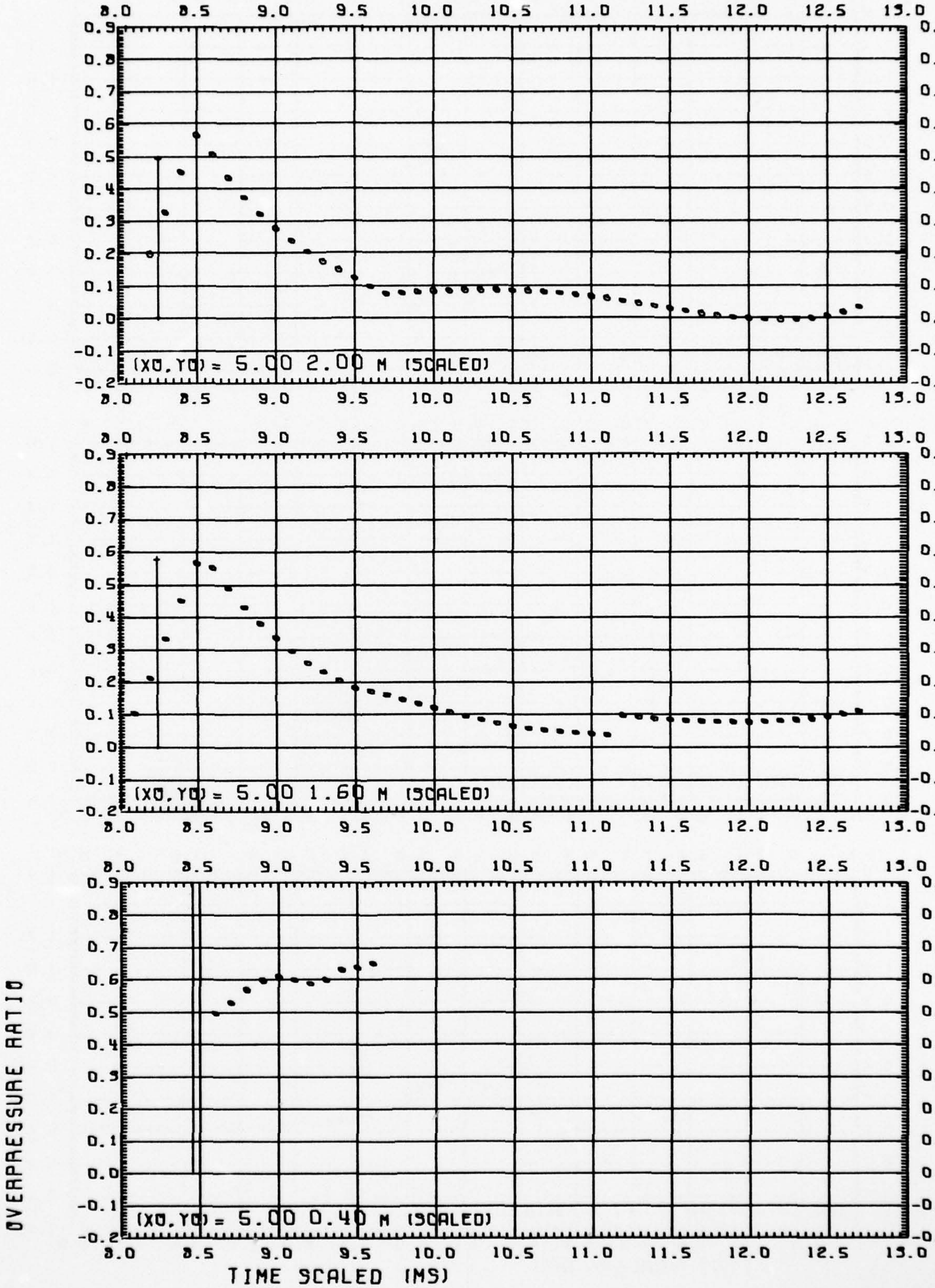


Fig. 25.5 HYDROSTATIC OVERPRESSURE, DIPOLE WEST/11

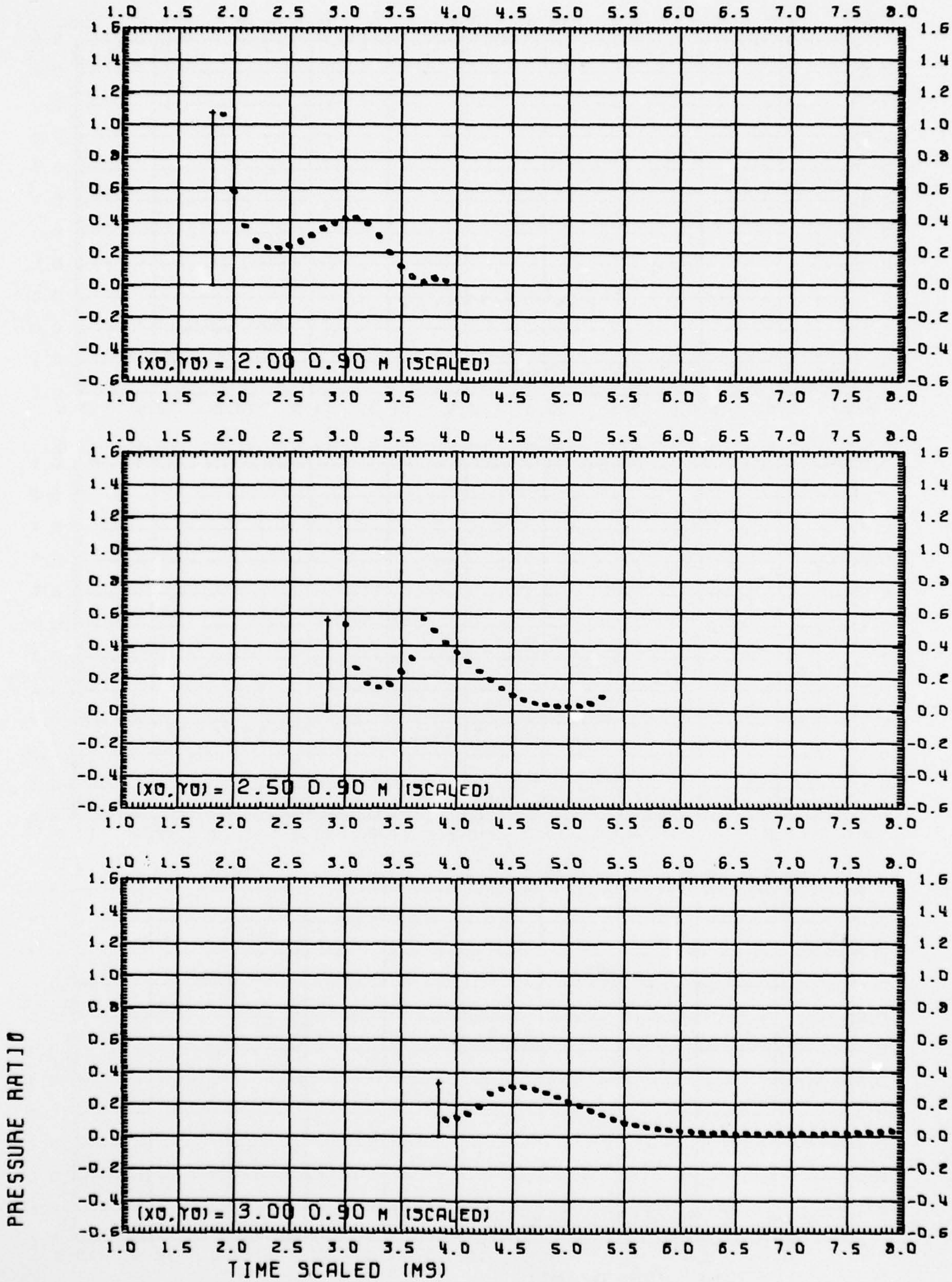


Fig. 26.1 DYNAMIC PRESSURE, DIPOLE WEST/11

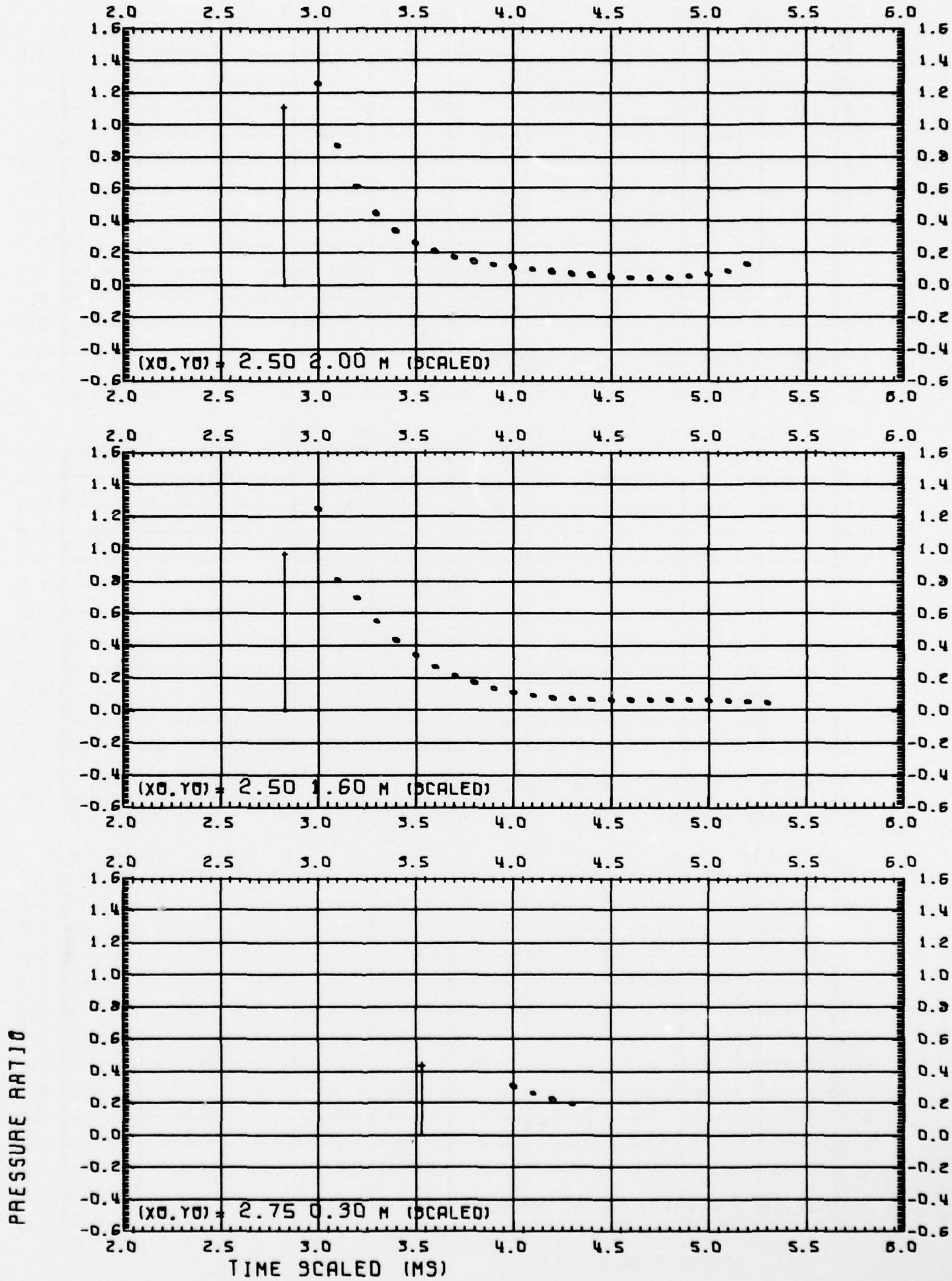


Fig. 26.2 DYNAMIC PRESSURE, DIPOLE WEST/11

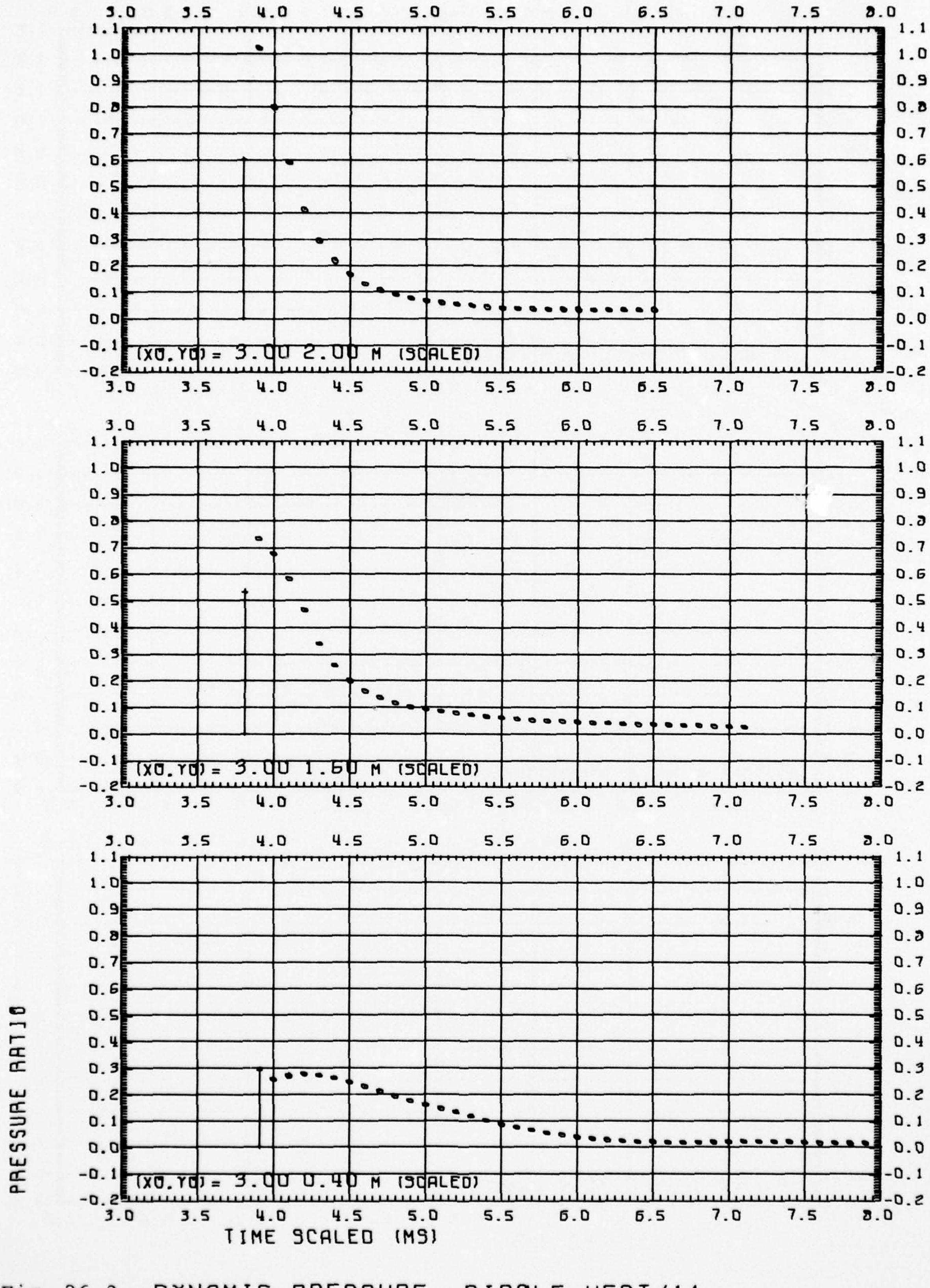


Fig. 26.3 DYNAMIC PRESSURE, DIPOLE WEST/11

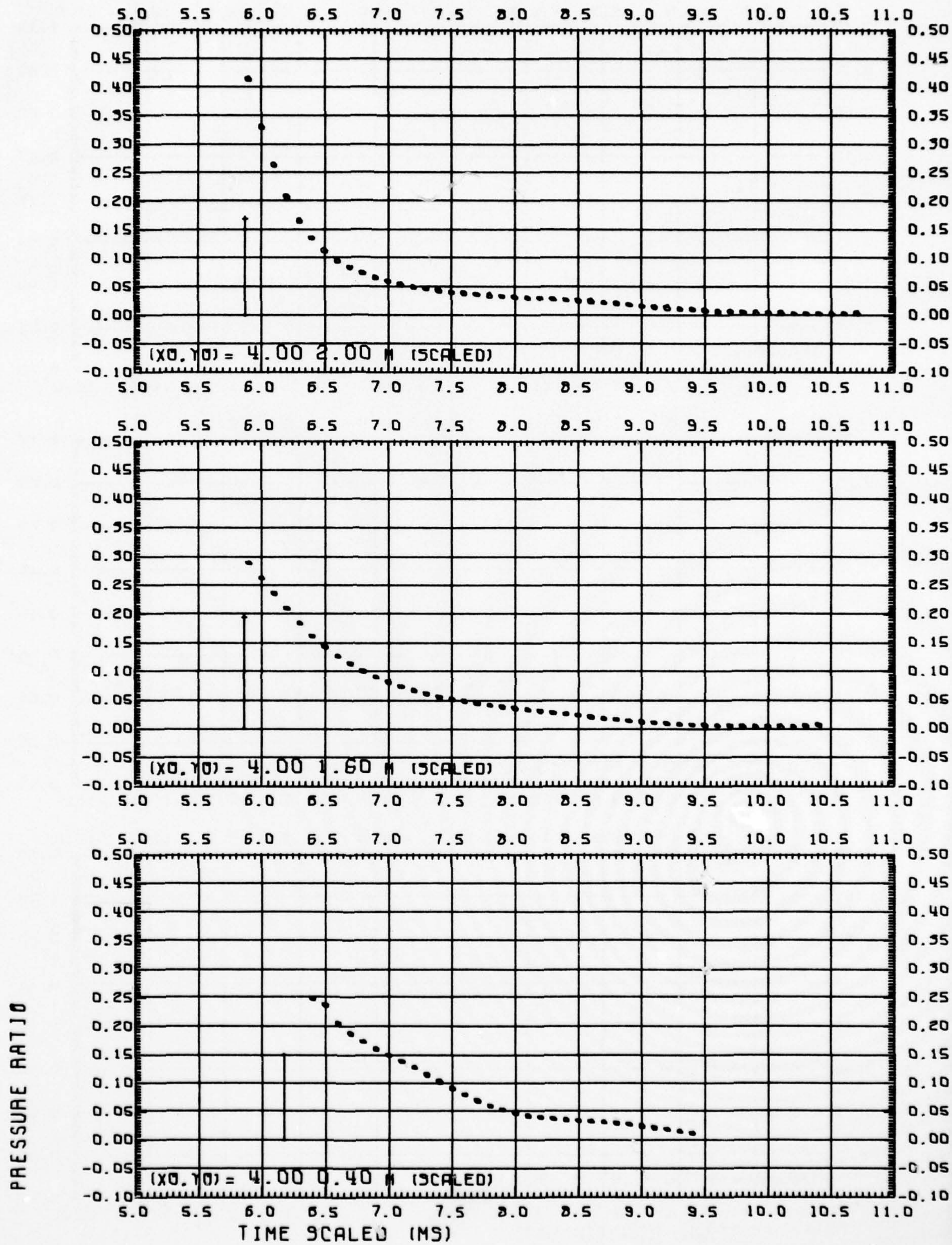


Fig. 26.4 DYNAMIC PRESSURE, DIPOLE WEST/11

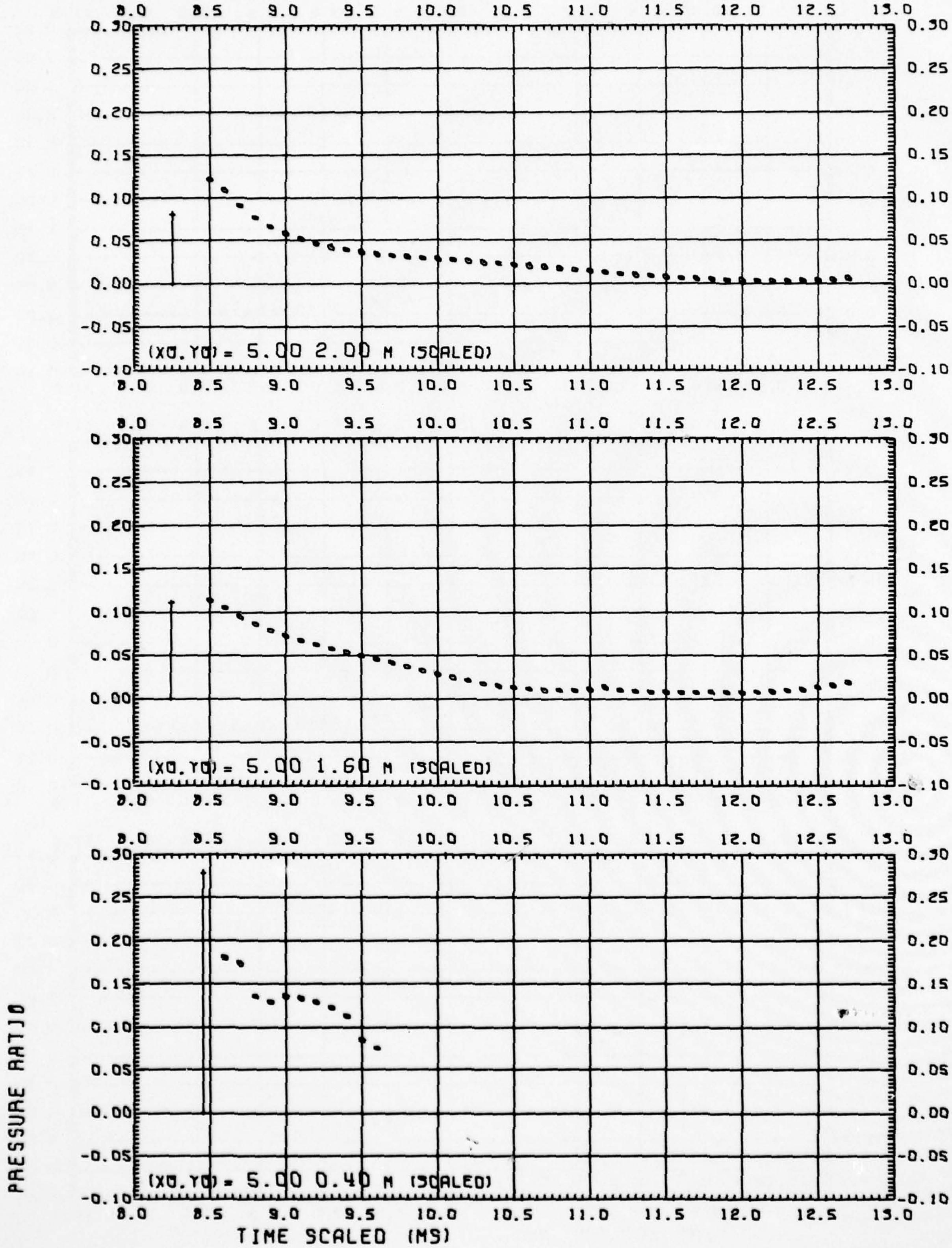


Fig. 26.5 DYNAMIC PRESSURE, DIPOLE WEST/11

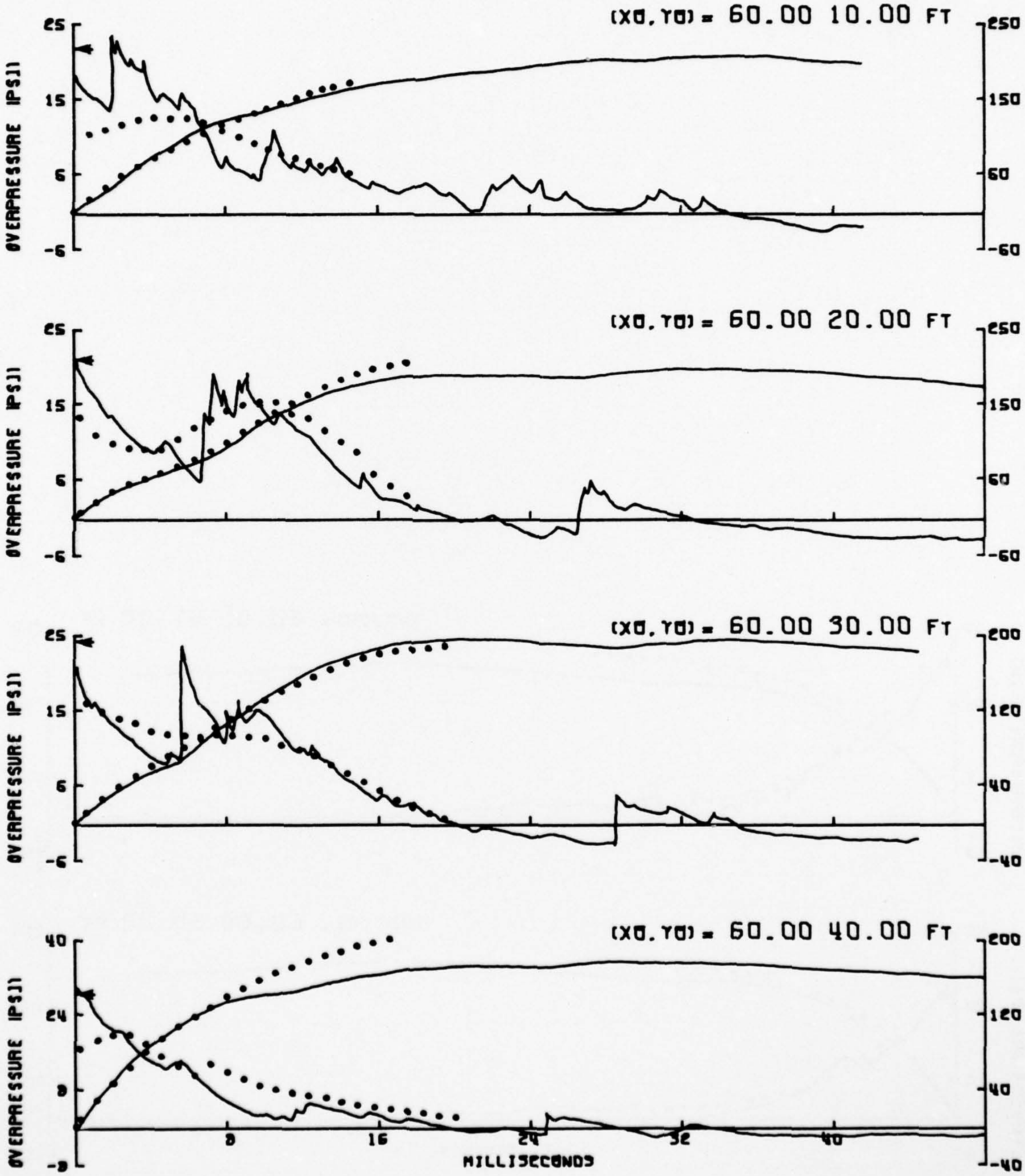


Fig. 27.1 DIPOLE WEST/11 HYDROSTATIC OVERPRESSURE

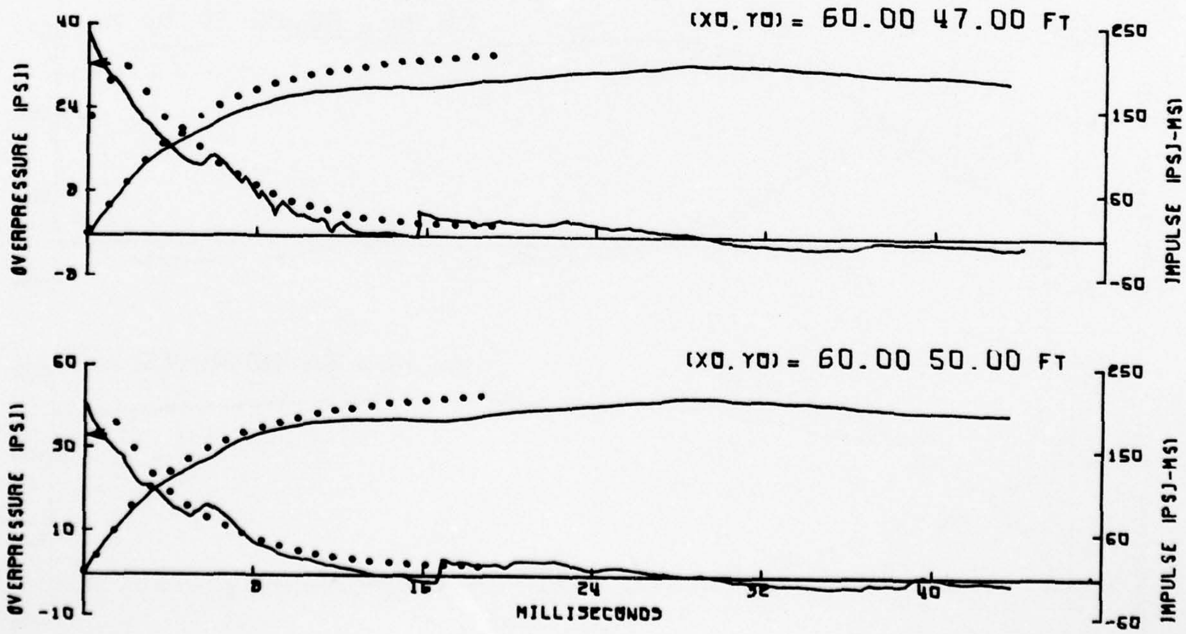


Fig. 27.2 DIPOLE WEST/11 HYDROSTATIC OVERPRESSURE

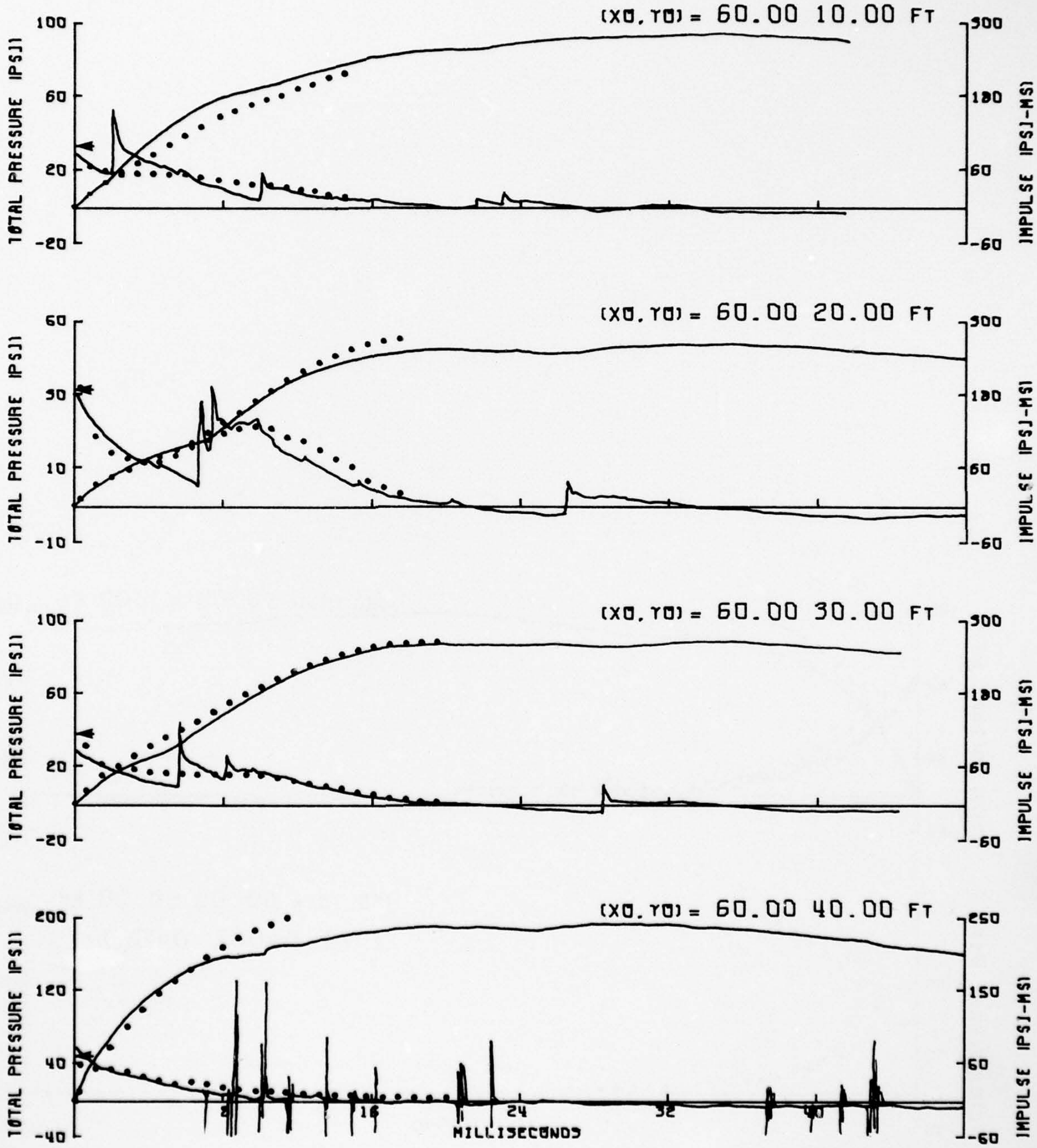


Fig. 27.3 DIPOLE WEST/11 TOTAL PRESSURE

AD-A058 377 GENERAL ELECTRIC CO ALBUQUERQUE N MEX TEMPO F/G 18/3
PHOTOGRAMMETRY OF THE PARTICLE TRAJECTORIES ON DIPOLE WEST SHOT--ETC(U)
MAR 78 J M DEWEY, D J MCMILLIN, D TRILL DNA001-77-C-0305
UNCLASSIFIED DNA-4326F-4 NL

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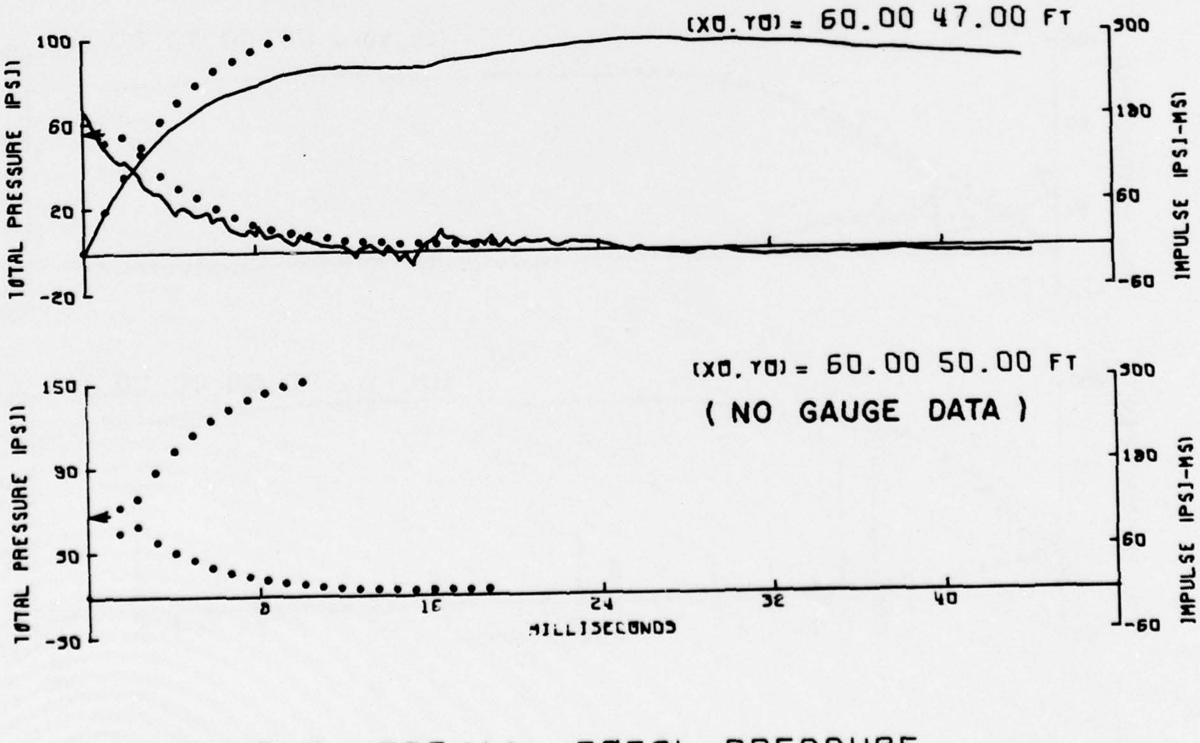

Fig. 27.4 DIPOLE WEST/11 TOTAL PRESSURE

TABLE 1

SURVEY DATA LIST   DIPOLE WEST/11   /A730120

PT. NAME	BEARING	DISTANCE	COORD. E	COORD. N	COORD. H
G.ZERO	0. 0. 0	0.0	2000.000	2000.000	2316.320
G.ZERO B	234.28.52	0.680	1999.446	1999.606	2316.320
G.ZERO C			1999.399	1999.598	2316.320
B.CHARGE	234.28.52	0.680	1999.446	1999.606	2340.295
T.CHARGE	237.35.50	0.763	1999.351	1999.590	2390.419
MCP	180. 2.47	598.713	1998.289	1401.290	2313.750
WF5/295			2003.245	1386.888	2340.643
VP 1A	333.24.43	106.193	1952.646	2095.052	2348.823
VP 1B	333.24.40	106.422	1952.533	2095.250	2383.752
VP 2A	317.56.24	121.905	1918.429	2090.592	2348.640
VP 2B	317.48.50	122.407	1917.996	2090.878	2383.605
VP 3A	305.18.51	149.196	1878.448	2086.514	2348.376
VP 3B	305.12.35	149.142	1878.275	2086.176	2383.340
W 1	257.20.55	35.586	1965.259	1992.289	2318.150
W 2	260.21.43	70.394	1930.578	1988.344	2318.070
W 3	261.29.48	105.189	1895.935	1984.663	2317.350
300 W1	183.33.57	314.780	1979.184	1685.909	2330.730
300 W2	187.40.48	320.020	1956.569	1682.941	2330.280
1-20.10	84. 7.37	19.875	2019.774	2002.002	2326.369
1-20.20	84.12.46	19.889	2019.792	2001.966	2336.381
1-20.30	84. 8.44	19.854	2019.754	2001.987	2346.396
1-20.40	84. 4.43	19.819	2019.717	2002.008	2356.412
1-20.50	83.56.22	19.792	2019.683	2002.071	2366.338
1-20.53	84. 6.13	19.716	2019.613	2002.014	2369.343
1-30.10	69.25. 1	29.023	2027.171	2010.202	2326.517
1-30.20	68.23. 2	30.020	2027.910	2011.056	2336.462
1-30.30	68.29.34	30.019	2027.945	2010.964	2346.242
1-30.40	68.36. 6	30.017	2027.950	2010.944	2356.023
1-30.50	68.46.45	30.039	2028.023	2010.818	2366.458
1-30.53	68.44.54	30.042	2028.024	2010.823	2369.426

BEARING IN DEGREES, MINUTES AND SECONDS, AND DISTANCE IN FEET
BEARING AND DISTANCE FROM G.ZERO   UNLESS NOTED OTHERWISE
COORDINATES EAST AND NORTH AND ELEVATION IN FEET
NUMBER OF POINTS LISTED ABOVE IS   30

SUNDRY DATA LIST

T= -2.4 DEG F. P= 13.7 PSI. RH= 60.0 %. SVP= 1.0 MM. W= 1080.0 LBS
SCALING TO WO= 2.2 LBS USING FACTORS S= 8.073 AND C= 1.049 FT/MSEC
CALCULATED DISTANCE BETWEEN B.CHARGE AND G.ZERO B IS 23.975 FEET CH
CALCULATED DISTANCE BETWEEN B.CHARGE AND T.CHARGE IS 50.124 FEET CS
CALCULATED DISTANCE BETWEEN G.ZERO AND G.ZERO C IS 0.723 FEET
PENTOLITE SPHERES, FIRED 08 NOV 73, SIMULTANEOUSLY

TABLE 2

PHOTOGRAMMETRICS   DIPOLE WEST/11 WF5/295 30°   /A730120

CAMERA POSITION IS 2003.2 FEET EAST, 1385.9 FEET NORTH AND 2340.6 FEET ELEVATION
OPTICAL AXIS IS ORIENTED -6.867 DEGREES EAST OF NORTH AND 0.652 DEGREES UPWARD
OBJECT PLANE INCLUDES G.ZERO C AND IS 608.5 FEET FROM CAMERA ALONG OPTICAL AXIS

CALIBRATION DATA TRANSFORMED TO THE OBJECT PLANE IN FEET

PT. NAME	COORD. X	COORD. Y	SHIFT X	SHIFT Y	
B.CHARGE	68.839	-6.844	0.619	-0.431	
VP 1A	27.486	0.330	2.064	-0.239	
VP 1B	27.257	29.689	2.189	0.341	
VP 2A	-0.553	-0.268	0.497	0.206	
VP 2B	-0.971	29.661	0.575	0.253	
VP 3A	-34.455	-0.343	-0.057	0.047	
VP 3B	-34.767	29.139	0.077	0.494	
W 1	34.855	-29.539	0.000	-0.000	REFERENCE POINT P1
W 2	-0.440	-29.501	0.208	-0.110	
W 3	-35.204	-30.315	-0.002	-0.001	REFERENCE POINT P2
300 W1	24.105	-27.047	-0.009	-0.012	REFERENCE POINT P3, P5
300 W2	-22.242	-28.089	0.003	0.098	REFERENCE POINT P4
1-20.10	89.792	-20.903	0.158	-0.298	
1-20.20	89.819	-10.752	0.132	-0.437	
1-20.30	89.642	-0.734	0.255	-0.443	
1-20.40	89.483	9.157	0.358	-0.325	
1-20.50	89.518	18.988	0.271	-0.244	
1-20.53	89.494	22.185	0.220	-0.438	
1-30.40	97.939	16.252	-0.128	-3.006	
1-30.50	97.878	18.984	-0.008	-0.442	
1-30.53	97.937	22.071	-0.070	-0.602	
AVERAGES			0.350	-0.504	

X-AXIS IS PARALLEL TO HORIZONTAL PLANE WITH ORIGIN WHERE OPTICAL AXIS INTERSECTS OBJECT PLANE. SHIFTS GIVE POINT POSITIONS WHICH ARE CALCULATED DIRECTLY FROM SURVEY DATA

MAXIMUM CALIBRATION ERROR SCALED= 0.080 FEET
MAXIMUM CAMERA ORIENTATION ERROR= 0.011 FEET

TOTAL ERRORS IN THE OBJECT PLANE= 0.091 FEET

TABLE 3

FILM TIMING DATA   DIPOLE WEST/11   WF5/295 30+   /A730120

STATIC ZERO = 3.90 CM
ACTUAL ZERO = 4.24 CM
FRAME LENGTH = 0.94625 CM

FRAME NO.	5-MSEC DISTANCE	FILM SPEED
-31	15.47 CM	3270./SEC
69	15.82 CM	3344./SEC
169	16.12 CM	3407./SEC
269	16.44 CM	3475./SEC
369	16.74 CM	3538./SEC
469	16.98 CM	3589./SEC
AVERAGES	16.26 CM	3437./SEC

STATIC ZERO IS CONSTANT FOR THE CAMERA
OTHER DATA ARE OBTAINED BY MEASUREMENT

FRAME TIMES IN MILLISECONDS FOR FRAMES 1 THROUGH 380 ARE:

1	0.4	2	0.7	3	1.0	4	1.3	5	1.6	6	1.9	7	2.2	8	2.5	9	2.8	10	3.1
11	3.4	12	3.7	13	4.0	14	4.4	15	4.7	16	5.0	17	5.3	18	5.6	19	5.9	20	6.2
21	6.5	22	6.8	23	7.1	24	7.4	25	7.7	26	8.0	27	8.3	28	8.6	29	8.9	30	9.2
31	9.5	32	9.8	33	10.1	34	10.4	35	10.7	36	11.0	37	11.3	38	11.6	39	11.9	40	12.2
41	12.5	42	12.8	43	13.1	44	13.4	45	13.7	46	14.0	47	14.3	48	14.6	49	14.9	50	15.2
51	15.5	52	15.8	53	16.1	54	16.4	55	16.7	56	17.0	57	17.3	58	17.6	59	17.9	60	18.2
61	18.5	62	18.8	63	19.1	64	19.4	65	19.7	66	20.0	67	20.3	68	20.6	69	20.9	70	21.2
71	21.5	72	21.8	73	22.1	74	22.4	75	22.7	76	23.0	77	23.3	78	23.6	79	23.9	80	24.2
81	24.5	82	24.8	83	25.1	84	25.4	85	25.7	86	26.0	87	26.3	88	26.6	89	26.9	90	27.2
91	27.5	92	27.8	93	28.1	94	28.3	95	28.6	96	28.9	97	29.2	98	29.5	99	29.8	100	30.1
101	30.4	102	30.7	103	31.0	104	31.3	105	31.6	106	31.9	107	32.2	108	32.5	109	32.8	110	33.1
111	33.4	112	33.7	113	34.0	114	34.3	115	34.6	116	34.9	117	35.2	118	35.5	119	35.8	120	36.1
121	36.4	122	36.7	123	37.0	124	37.3	125	37.5	126	37.8	127	38.1	128	38.4	129	38.7	130	39.0
131	39.3	132	39.6	133	39.9	134	40.2	135	40.5	136	40.8	137	41.1	138	41.4	139	41.7	140	42.0
141	42.3	142	42.6	143	42.9	144	43.2	145	43.5	146	43.7	147	44.0	148	44.3	149	44.6	150	44.9
151	45.2	152	45.5	153	45.8	154	46.1	155	46.4	156	46.7	157	47.0	158	47.3	159	47.6	160	47.9
161	48.2	162	48.5	163	48.8	164	49.0	165	49.3	166	49.6	167	49.9	168	50.2	169	50.5	170	50.8
171	51.1	172	51.4	173	51.7	174	52.0	175	52.3	176	52.6	177	52.9	178	53.2	179	53.4	180	53.7
181	54.0	182	54.3	183	54.6	184	54.9	185	55.2	186	55.5	187	55.8	188	56.1	189	56.4	190	56.7
191	57.0	192	57.2	193	57.5	194	57.8	195	58.1	196	58.4	197	58.7	198	59.0	199	59.3	200	59.6
201	59.9	202	60.2	203	60.5	204	60.8	205	61.0	206	61.3	207	61.6	208	61.9	209	62.2	210	62.5
211	62.8	212	63.1	213	63.4	214	63.7	215	64.0	216	64.2	217	64.5	218	64.8	219	65.1	220	65.4
221	65.7	222	66.0	223	66.3	224	66.6	225	66.9	226	67.2	227	67.4	228	67.7	229	68.0	230	68.3
231	68.6	232	68.9	233	69.2	234	69.5	235	69.8	236	70.1	237	70.3	238	70.6	239	70.9	240	71.2
241	71.5	242	71.8	243	72.1	244	72.4	245	72.7	246	72.9	247	73.2	248	73.5	249	73.8	250	74.1
251	74.4	252	74.7	253	75.0	254	75.3	255	75.5	256	75.8	257	76.1	258	76.4	259	76.7	260	77.0
261	77.3	262	77.6	263	77.9	264	78.1	265	78.4	266	78.7	267	79.0	268	79.3	269	79.6	270	79.9
271	80.2	272	80.4	273	80.7	274	81.0	275	81.3	276	81.6	277	81.9	278	82.2	279	82.5	280	82.7
281	83.0	282	83.3	283	83.6	284	83.9	285	84.2	286	84.5	287	84.8	288	85.0	289	85.3	290	85.6
291	85.9	292	86.2	293	86.5	294	86.8	295	87.0	296	87.3	297	87.6	298	87.9	299	88.2	300	88.5
301	88.8	302	89.0	303	89.3	304	89.6	305	89.9	306	90.2	307	90.5	308	90.8	309	91.0	310	91.3
311	91.6	312	91.9	313	92.2	314	92.5	315	92.8	316	93.0	317	93.3	318	93.6	319	93.9	320	94.2
321	94.5	322	94.8	323	95.0	324	95.3	325	95.6	326	95.9	327	96.2	328	96.5	329	96.7	330	97.0
331	97.3	332	97.6	333	97.9	334	98.2	335	98.5	336	98.7	337	99.0	338	99.3	339	99.6	340	99.9
341	100.2	342	100.4	343	100.7	344	101.0	345	101.3	346	101.6	347	101.9	348	102.1	349	102.4	350	102.7
351	103.0	352	103.3	353	103.6	354	103.8	355	104.1	356	104.4	357	104.7	358	105.0	359	105.3	360	105.5
361	105.8	362	106.1	363	106.4	364	106.7	365	107.0	366	107.2	367	107.5	368	107.8	369	108.1	370	108.4
371	108.7	372	108.9	373	109.2	374	109.5	375	109.8	376	110.1	377	110.3	378	110.6	379	110.9	380	111.2

TABLE 4

TIMES OF ARRIVAL   DIPOLE WEST/11   WF5/295 30°   SMOKE PUFF GRID 1220   /A780120

AMBIENT TEMPERATURE T= -19.11 DEGREES CELSIUS
AMBIENT PRESSURE P= 94.34 KILOPASCALS
RELATIVE HUMIDITY RH= 60.0 PER CENT
VAPOUR PRESSURE VP= 0.08 KILOPASCALS
AMBIENT SPEED OF SOUND C= 319.689 METERS/SECOND
CHARGE WEIGHT W= 489.9 KILOGRAMS
CHARGE HEIGHT H= 7.31 METERS
SEPARATION #2 HS= 7.64 METERS
SACHS SCALING FACTOR S= 8.0730
SCALING TO CHARGE WEIGHT WO= 1.0 KILOGRAMS

INITIAL PUFF POSITIONS, TIMES OF ARRIVAL, AND PEAK PARTICLE VELOCITIES DERIVED BY TRAJECTORY FITTING

PUFF NUMBER	X-OBS METERS	Y-OBS METERS	T-OBS MSEC	X-SCAL METERS	Y-SCAL METERS	T-SCAL MSEC	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGION CODE
1	8.813	17.277	5.863	1.092	2.140	0.682	1.158	-1.204	1.671	1.274	2
2	8.704	15.862	6.769	1.078	1.965	0.788	1.453	-0.912	1.716	1.362	2
3	8.626	14.208	6.769	1.069	1.760	0.788	1.413	0.639	1.551	1.368	1
4	8.568	12.603	5.863	1.061	1.561	0.682	1.329	1.297	1.857	1.248	1
5	8.462	11.287	4.956	1.048	1.398	0.577	1.576	1.250	2.018	1.158	1
6	8.593	9.909	4.653	1.064	1.227	0.542	2.107	0.734	2.231	1.112	1
7	8.362	8.572	4.048	1.036	1.062	0.471	2.479	0.278	2.495	1.048	1
8	8.281	6.952	3.443	1.026	0.861	0.401	1.115	-0.201	1.132	1.027	1
9	8.076	5.368	3.443	1.000	0.665	0.401	1.654	0.055	1.655	1.029	1
10	8.189	3.891	4.653	1.014	0.482	0.542	2.149	-0.952	2.354	1.099	1
11	7.992	2.461	4.956	0.990	0.305	0.577	1.194	-1.258	1.756	1.158	1
12	7.931	0.957	6.165	0.982	0.119	0.717	1.003	-1.259	1.610	1.259	1
13	11.629	17.053	9.785	1.441	2.112	1.139	1.889	-1.136	2.204	1.595	2
14	11.561	15.782	10.388	1.432	1.955	1.209	1.132	-0.700	1.331	1.436	5
15	11.604	14.372	10.388	1.437	1.780	1.209	1.377	-0.158	1.388	1.439	4
16	11.422	12.811	9.183	1.415	1.587	1.069	1.040	0.597	1.200	1.570	1
17	11.526	11.365	8.580	1.428	1.408	0.998	1.263	0.676	1.432	1.514	1
18	11.381	9.839	7.675	1.410	1.225	0.893	1.681	0.456	1.742	1.446	1
19	11.220	8.151	7.373	1.390	1.010	0.858	1.982	0.397	2.021	1.394	1
20	11.098	6.868	7.071	1.375	0.851	0.823	1.993	-0.164	2.000	1.376	1
21	11.047	5.242	6.769	1.368	0.649	0.788	0.690	-0.416	0.806	1.392	1
22	11.064	3.873	7.373	1.370	0.480	0.858	1.194	-0.369	1.250	1.435	1
23	10.795	2.336	7.675	1.337	0.289	0.893	0.801	-0.529	0.960	1.472	1
25	14.504	17.309	13.998	1.797	2.144	1.629	1.009	-0.400	1.085	1.912	2
26	14.477	15.814	14.298	1.793	1.959	1.664	1.382	0.018	1.382	1.795	5
27	14.336	14.439	13.998	1.776	1.789	1.629	1.445	-0.194	1.458	1.777	4
28	14.198	12.763	13.096	1.759	1.581	1.524	0.755	0.248	0.795	1.884	1
29	14.166	11.051	12.194	1.755	1.369	1.419	0.831	0.404	0.924	1.815	1
30	14.175	9.532	12.194	1.756	1.181	1.419	1.208	0.350	1.258	1.777	1
31	14.330	8.093	12.194	1.775	1.002	1.419	1.442	0.072	1.444	1.778	1
32	14.132	7.012	12.194	1.751	0.869	1.419	1.540	0.018	1.540	1.751	1
33	14.379	5.609	12.194	1.781	0.695	1.419	1.356	-0.095	1.359	1.794	1
34	13.988	3.759	12.194	1.733	0.466	1.419	0.834	-0.343	0.902	1.788	1
35	14.034	2.397	13.096	1.738	0.297	1.524	0.921	-0.536	1.066	1.842	1
36	14.115	0.861	14.598	1.748	0.107	1.699	1.194	-0.283	1.227	1.922	1
37	16.403	17.265	16.999	2.032	2.139	1.978	0.804	-0.177	0.824	2.136	2
38	16.405	15.730	16.999	2.032	1.949	1.978	1.028	0.022	1.028	2.034	5
39	16.540	14.297	16.999	2.049	1.771	1.978	0.874	-0.171	0.891	2.050	4
40	16.485	12.848	17.598	2.042	1.592	2.048	1.043	-0.464	1.142	2.154	1
41	16.391	11.310	15.799	2.030	1.401	1.839	0.337	0.063	0.343	2.090	1
42	16.475	9.874	15.799	2.041	1.223	1.839	0.740	0.073	0.744	2.065	1
43	16.462	8.491	15.799	2.039	1.052	1.839	1.087	-0.096	1.091	2.044	1
44	16.291	6.927	15.799	2.018	0.858	1.839	1.155	-0.126	1.162	2.019	1
45	16.270	5.371	15.799	2.015	0.665	1.839	1.102	-0.156	1.115	2.030	1
46	16.136	3.943	15.799	1.999	0.488	1.839	0.536	-0.258	0.595	2.042	1

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TABLE 4 continued

47	16.189	2.542	16.099	2.005	0.315	1.373	0.561	-0.413	0.697	2.090	1
48	16.022	0.368	17.299	1.985	0.108	2.013	0.515	-0.057	0.519	1.988	3
49	18.544	17.339	21.190	2.297	2.148	2.466	1.236	0.247	1.261	2.316	5
50	18.627	15.726	21.788	2.307	1.948	2.535	1.264	0.110	1.259	2.309	5
51	18.574	14.228	20.891	2.301	1.762	2.431	0.960	-0.047	0.951	2.302	4
52	18.463	12.719	20.592	2.287	1.576	2.396	1.003	-0.065	1.005	2.304	4
53	18.444	11.141	20.592	2.255	1.380	2.396	0.839	-0.049	0.840	2.333	1
54	18.383	9.691	20.293	2.277	1.200	2.362	0.673	0.184	0.697	2.296	1
55	18.474	8.422	20.293	2.288	1.043	2.362	0.901	-0.119	0.909	2.293	1
56	18.428	6.850	20.293	2.283	0.848	2.362	0.959	-0.188	0.977	2.283	1
57	18.164	5.284	20.293	2.250	0.655	2.362	1.072	-0.287	1.110	2.264	1
58	18.201	4.076	20.293	2.255	0.505	2.362	0.666	-0.150	0.683	2.290	1
59	18.078	2.436	20.293	2.239	0.302	2.362	0.669	-0.352	0.756	2.319	1
60	17.986	1.044	20.891	2.228	0.129	2.431	0.670	-0.432	0.825	2.252	3
61	20.930	17.595	25.668	2.593	2.180	2.987	0.975	0.134	0.984	2.613	5
62	20.832	16.018	25.370	2.580	1.984	2.952	1.107	-0.022	1.108	2.584	5
63	20.800	14.658	25.370	2.576	1.816	2.952	1.205	-0.086	1.208	2.577	4
64	20.803	12.888	25.668	2.577	1.596	2.987	1.167	-0.058	1.169	2.589	4
65	20.674	11.428	25.668	2.561	1.416	2.987	1.064	-0.092	1.068	2.598	4
66	20.668	10.055	25.668	2.560	1.245	2.987	0.748	0.034	0.748	2.583	1
67	20.705	8.435	25.370	2.565	1.045	2.952	1.267	-0.224	1.287	2.569	1
68	20.594	7.059	25.370	2.551	0.874	2.952	1.008	-0.121	1.015	2.551	1
69	20.526	5.681	25.370	2.543	0.704	2.952	1.689	-0.332	1.731	2.550	1
70	20.534	4.142	25.370	2.550	0.513	2.952	0.491	-0.209	0.534	2.580	1
71	20.320	2.585	25.370	2.517	0.320	2.952	0.686	-0.234	0.725	2.584	1
72	20.209	0.974	25.370	2.503	0.121	2.952	0.638	-0.134	0.652	2.506	3
73	23.021	17.487	31.025	2.852	2.166	3.610	1.259	0.152	1.269	2.869	5
74	22.915	15.702	31.025	2.838	1.945	3.610	1.189	0.149	1.198	2.840	5
75	22.887	14.261	31.025	2.835	1.767	3.610	1.333	-0.144	1.340	2.835	4
76	22.823	13.015	31.025	2.827	1.612	3.610	1.148	-0.171	1.161	2.837	4
77	22.878	11.415	31.025	2.834	1.414	3.610	0.871	-0.184	0.890	2.867	4
78	22.880	10.132	31.025	2.834	1.255	3.610	0.999	-0.197	1.018	2.856	1
79	22.673	8.430	31.025	2.809	1.044	3.610	0.640	-0.019	0.640	2.812	1
80	22.560	7.062	31.025	2.795	0.875	3.610	1.067	-0.158	1.078	2.795	1
81	22.478	5.458	31.025	2.784	0.676	3.610	0.490	-0.109	0.502	2.794	1
82	22.584	4.187	31.025	2.797	0.519	3.610	0.687	-0.076	0.691	2.824	1
83	22.402	2.532	31.025	2.775	0.314	3.610	0.782	-0.116	0.790	2.793	3
85	24.805	17.328	33.400	3.073	2.146	3.887	1.002	0.158	1.014	3.087	5
86	24.693	15.685	33.400	3.059	1.943	3.887	0.927	0.083	0.931	3.060	5
87	24.876	14.191	33.400	3.081	1.758	3.887	0.962	0.076	0.965	3.083	4
88	24.715	12.789	33.400	3.061	1.584	3.887	0.734	0.004	0.734	3.073	4
89	24.572	11.298	33.400	3.044	1.399	3.887	0.820	-0.114	0.828	3.077	4
90	24.595	9.805	33.696	3.047	1.215	3.921	0.724	-0.139	0.737	3.112	4
91	24.511	8.399	33.400	3.036	1.040	3.887	0.460	-0.082	0.468	3.039	1
92	24.426	6.930	33.103	3.026	0.865	3.852	0.268	0.031	0.270	3.026	1
93	24.444	5.460	33.400	3.028	0.676	3.887	0.461	-0.050	0.464	3.035	1
94	24.342	3.992	33.696	3.015	0.494	3.921	0.528	-0.021	0.529	3.055	3
95	24.356	2.440	33.696	3.017	0.302	3.921	0.470	-0.031	0.477	3.032	3
96	24.405	0.901	33.696	3.023	0.112	3.921	0.393	0.005	0.393	3.025	3
97	26.196	17.231	36.659	3.245	2.134	4.266	0.795	0.106	0.803	3.257	5
98	26.363	15.610	36.955	3.256	1.934	4.300	0.841	0.121	0.850	3.267	5
99	26.185	14.234	36.659	3.244	1.763	4.266	0.914	0.069	0.917	3.245	4
100	26.235	12.766	36.659	3.250	1.581	4.266	0.917	0.057	0.920	3.261	4
101	26.038	11.189	36.659	3.231	1.386	4.266	0.796	0.013	0.797	3.265	4
102	26.107	9.552	36.659	3.234	1.183	4.266	0.628	-0.110	0.637	3.302	4
103	25.919	8.379	36.955	3.211	1.038	4.300	0.453	-0.176	0.486	3.312	4
104	25.970	6.843	36.955	3.217	0.848	4.300	0.304	-0.101	0.320	3.217	1
105	25.912	5.477	36.955	3.210	0.678	4.300	0.347	-0.007	0.347	3.218	1
106	26.005	3.819	37.843	3.221	0.473	4.404	0.441	0.034	0.442	3.256	3
107	25.880	2.305	37.251	3.206	0.286	4.335	0.594	0.061	0.597	3.218	3
108	25.817	0.776	36.955	3.198	0.096	4.300	0.893	0.090	0.895	3.199	3
109	27.927	17.160	40.207	3.459	2.126	4.679	0.699	0.111	0.708	3.470	5
110	27.880	15.699	39.912	3.454	1.945	4.645	0.753	0.154	0.769	3.455	5
111	27.793	14.194	40.207	3.443	1.758	4.679	0.679	0.052	0.681	3.444	4

TABLE 4 continued

112	27.733	12.538	39.912	3.435	1.553	4.645	0.619	0.031	0.621	3.448	4
113	27.718	11.178	40.207	3.433	1.385	4.679	0.521	-0.114	0.533	3.465	4
114	27.678	9.745	40.207	3.428	1.207	4.679	0.537	-0.200	0.573	3.489	4
115	27.712	8.201	41.389	3.433	1.016	4.816	0.639	-0.133	0.652	3.533	4
116	27.706	6.826	39.912	3.432	0.846	4.645	0.052	-0.020	0.056	3.432	1
117	27.525	5.337	39.912	3.410	0.661	4.645	0.103	0.019	0.104	3.473	3
118	27.434	3.849	41.584	3.398	0.477	4.851	0.481	0.057	0.486	3.432	3
119	27.381	2.378	40.798	3.392	0.295	4.748	0.499	0.047	0.501	3.404	3
121	29.066	17.339	43.158	3.600	2.148	5.022	0.663	0.063	0.666	3.613	5
122	29.266	15.672	43.158	3.625	1.941	5.022	0.725	0.038	0.731	3.626	5
123	29.179	14.074	43.158	3.614	1.743	5.022	0.690	0.007	0.690	3.616	4
124	29.084	12.630	43.158	3.603	1.565	5.022	0.774	-0.047	0.776	3.614	4
125	29.004	11.126	43.158	3.593	1.378	5.022	0.485	-0.031	0.492	3.624	4
126	29.202	9.993	43.158	3.617	1.238	5.022	0.448	-0.147	0.472	3.669	4
127	28.966	8.265	43.158	3.588	1.024	5.022	0.216	-0.176	0.279	3.682	4
128	28.998	6.726	45.515	3.592	0.833	5.297	0.627	-0.097	0.635	3.734	4
129	28.963	5.342	44.926	3.588	0.662	5.228	0.415	-0.013	0.415	3.648	3
130	28.953	3.314	44.926	3.586	0.472	5.228	0.312	0.085	0.324	3.617	3
131	28.909	2.311	46.692	3.581	0.286	5.434	1.028	0.187	1.045	3.592	3
133	30.746	17.062	46.692	3.808	2.113	5.434	0.597	0.031	0.597	3.817	5
134	30.862	15.577	46.692	3.823	1.930	5.434	0.632	0.011	0.633	3.824	5
135	30.682	14.052	46.692	3.801	1.741	5.434	0.549	-0.030	0.550	3.802	4
136	30.652	12.564	46.692	3.797	1.556	5.434	0.632	0.091	0.639	3.808	4
137	30.670	11.195	46.692	3.799	1.387	5.434	0.537	-0.112	0.548	3.827	4
138	30.547	9.759	46.692	3.784	1.209	5.434	0.443	-0.130	0.476	3.838	4
139	30.473	8.290	47.281	3.775	1.027	5.502	0.389	-0.051	0.393	3.864	4
140	30.529	6.691	48.750	3.782	0.829	5.673	0.570	-0.168	0.594	3.917	4
141	30.547	5.421	49.333	3.784	0.672	5.741	0.662	-0.074	0.657	3.843	3
142	30.504	4.034	48.750	3.779	0.500	5.673	0.478	-0.038	0.480	3.811	3
143	30.364	2.314	48.163	3.761	0.237	5.605	0.480	0.043	0.482	3.772	3
145	32.246	17.072	50.219	3.994	2.115	5.844	0.644	0.048	0.645	4.003	5
146	32.227	15.458	50.512	3.992	1.915	5.878	0.649	0.071	0.653	3.992	5
147	32.255	13.926	50.219	3.995	1.725	5.844	0.625	-0.038	0.627	3.997	4
148	32.199	12.335	50.219	3.989	1.528	5.844	0.505	-0.124	0.519	4.002	4
149	32.169	10.845	50.512	3.985	1.343	5.878	0.400	-0.052	0.403	4.017	4
150	32.339	9.516	51.099	4.006	1.179	5.946	0.414	-0.171	0.448	4.062	4
151	32.076	8.033	51.392	3.973	0.995	5.981	0.381	-0.297	0.483	4.064	4
152	32.081	6.574	52.565	3.974	0.814	6.117	0.593	-0.073	0.597	4.107	4
153	31.818	4.995	52.565	3.941	0.619	6.117	0.603	-0.041	0.605	3.990	3
154	31.954	3.402	52.565	3.958	0.421	6.117	0.525	-0.096	0.534	3.981	3
155	31.898	1.908	50.219	3.951	0.236	5.844	0.154	-0.076	0.172	3.958	3
157	33.726	17.090	54.323	4.178	2.117	6.322	0.573	0.104	0.583	4.185	5
158	33.772	15.615	54.323	4.183	1.934	6.322	0.696	0.072	0.700	4.184	5
159	33.703	14.047	54.323	4.175	1.740	6.322	0.519	-0.033	0.520	4.176	4
160	33.593	12.540	54.323	4.161	1.553	6.322	0.628	-0.006	0.628	4.172	4
161	33.572	11.035	54.323	4.159	1.367	6.322	0.479	-0.130	0.496	4.187	4
162	33.621	9.683	54.323	4.165	1.199	6.322	0.409	-0.133	0.448	4.215	4
163	33.534	8.158	54.323	4.154	1.010	6.322	0.429	-0.092	0.439	4.233	4
164	33.481	6.764	54.908	4.147	0.838	6.390	0.502	-0.324	0.597	4.269	4
165	33.583	5.188	56.078	4.160	0.643	6.526	0.621	-0.200	0.653	4.209	3
166	33.541	3.811	56.078	4.155	0.472	6.526	0.535	-0.107	0.546	4.181	3
167	33.401	2.252	54.908	4.137	0.279	6.390	0.243	-0.017	0.244	4.147	3
168	33.512	0.898	54.908	4.151	0.111	6.390	0.826	-2.223	2.371	4.153	3
169	35.250	16.954	58.416	4.366	2.100	6.798	0.552	0.104	0.561	4.373	5
170	35.344	15.416	58.708	4.378	1.910	6.832	0.493	0.013	0.498	4.378	5
171	35.438	14.007	59.000	4.390	1.735	6.866	0.632	0.010	0.632	4.391	4
172	35.293	12.393	59.000	4.372	1.535	6.866	0.474	-0.047	0.476	4.383	4
173	35.284	11.037	59.000	4.371	1.367	6.866	0.492	-0.047	0.494	4.397	4
174	35.211	9.593	58.416	4.362	1.188	6.798	0.460	-0.067	0.465	4.412	4
175	35.066	8.025	58.703	4.344	0.994	6.832	0.532	-0.036	0.533	4.427	4
176	34.955	6.639	58.416	4.330	0.822	6.798	0.260	-0.119	0.286	4.450	4
177	35.054	5.235	58.703	4.342	0.648	6.832	0.367	-0.126	0.388	4.390	3
178	35.040	3.485	59.875	4.340	0.432	6.968	0.564	-0.091	0.572	4.362	3
179	35.199	2.004	61.041	4.360	0.248	7.103	0.555	0.066	0.559	4.367	3

TABLE 4 continued

181	36.963	17.161	62.789	4.579	2.126	7.307	0.521	0.032	0.522	4.587	5
182	36.917	15.495	62.498	4.573	1.919	7.273	0.460	-0.003	0.460	4.575	5
183	36.920	13.919	63.081	4.573	1.724	7.341	0.593	-0.015	0.593	4.575	4
184	36.850	12.427	62.498	4.565	1.539	7.273	0.398	-0.115	0.415	4.575	4
185	36.743	11.059	62.498	4.551	1.370	7.273	0.465	-0.156	0.491	4.577	4
186	36.783	9.891	62.789	4.556	1.188	7.307	0.452	-0.059	0.457	4.604	4
187	36.664	8.394	62.789	4.542	1.003	7.307	0.689	0.024	0.689	4.620	4
188	36.557	6.569	62.498	4.528	0.814	7.273	0.472	0.193	0.509	4.646	4
189	36.536	5.371	62.498	4.526	0.665	7.273	0.307	-0.238	0.388	4.574	3
190	36.580	3.333	62.789	4.531	0.444	7.307	0.260	-0.147	0.299	4.553	3
191	36.492	2.159	62.498	4.520	0.267	7.273	0.326	0.056	0.331	4.528	3
193	38.229	17.043	65.698	4.735	2.111	7.645	0.462	0.051	0.466	4.743	5
194	38.085	15.657	65.698	4.718	1.939	7.645	0.451	0.023	0.451	4.718	5
195	38.298	13.835	65.698	4.744	1.720	7.645	0.406	-0.001	0.406	4.746	4
196	38.133	12.491	65.698	4.723	1.547	7.645	0.524	-0.257	0.538	4.733	4
197	37.973	10.959	65.698	4.704	1.359	7.645	0.380	-0.115	0.397	4.729	4
198	38.093	9.661	65.698	4.719	1.184	7.645	0.449	-0.028	0.450	4.766	4
199	38.160	8.094	66.570	4.727	1.003	7.747	0.440	0.016	0.440	4.802	4
200	38.124	6.596	66.570	4.722	0.817	7.747	0.518	-0.128	0.534	4.834	4
201	37.921	5.258	65.403	4.697	0.651	7.611	0.439	-0.078	0.446	4.742	3
202	37.925	3.610	66.570	4.698	0.447	7.747	0.484	-0.171	0.514	4.719	3
203	38.032	2.013	69.761	4.711	0.249	8.118	0.668	0.097	0.675	4.718	3
205	39.731	16.914	69.471	4.922	2.095	8.084	0.448	-0.030	0.449	4.928	5
206	39.642	15.471	69.471	4.910	1.916	8.084	0.485	-0.032	0.486	4.911	5
207	39.729	14.003	68.891	4.921	1.735	8.017	0.389	-0.079	0.397	4.923	4
208	39.869	12.616	69.761	4.939	1.563	8.118	0.340	-0.125	0.362	4.947	4
209	39.575	10.941	69.471	4.902	1.355	8.084	0.430	-0.053	0.434	4.927	4
210	39.595	9.557	68.391	4.905	1.184	8.017	0.387	-0.072	0.394	4.950	4
211	39.669	8.074	69.471	4.914	1.000	8.084	0.285	-0.174	0.334	4.987	4
212	39.571	6.520	71.209	4.902	0.808	8.287	0.753	0.117	0.762	5.012	4
213	39.606	5.134	70.340	4.906	0.636	8.186	0.194	-0.533	0.567	4.947	3
215	39.481	2.152	71.493	4.890	0.267	8.320	0.625	0.044	0.626	4.898	3
217	41.221	16.866	73.234	5.106	2.089	8.522	0.491	-0.030	0.491	5.112	5
218	41.143	15.302	72.945	5.096	1.895	8.489	0.344	-0.095	0.357	5.097	5
219	41.209	13.927	72.945	5.105	1.725	8.489	0.396	-0.093	0.407	5.106	4
220	41.112	12.355	73.523	5.093	1.530	8.556	0.443	0.021	0.444	5.103	4
221	41.107	11.002	73.234	5.092	1.363	8.522	0.408	-0.070	0.414	5.115	4
222	41.210	9.343	73.234	5.105	1.157	8.522	0.337	-0.023	0.337	5.152	4
223	41.185	8.035	74.390	5.102	0.995	8.657	0.675	-0.425	0.798	5.173	4
224	41.181	6.779	74.101	5.101	0.840	8.623	1.020	-0.604	1.186	5.200	4
225	40.970	5.151	73.234	5.075	0.638	8.522	1.029	0.334	1.082	5.115	3
226	40.909	3.664	73.523	5.067	0.454	8.556	0.402	-0.191	0.445	5.088	3
227	40.932	2.068	74.390	5.070	0.256	8.657	0.849	-0.610	1.045	5.077	3
229	42.495	17.191	76.122	5.264	2.129	8.858	0.230	-0.042	0.234	5.271	5
230	42.566	15.300	76.410	5.273	1.895	8.892	0.324	0.011	0.324	5.273	5
231	42.592	13.871	76.122	5.276	1.718	8.858	0.305	-0.030	0.309	5.277	4
232	42.659	12.500	76.410	5.284	1.548	8.892	0.247	-0.024	0.248	5.293	4
233	42.579	10.995	76.122	5.274	1.362	8.858	0.194	-0.054	0.202	5.297	4
234	42.529	9.344	76.122	5.268	1.157	8.858	0.156	-0.112	0.192	5.314	4
235	42.543	8.099	76.122	5.270	1.003	8.858	0.007	-0.626	0.626	5.338	4
236	42.655	6.706	76.122	5.284	0.831	8.858	0.229	0.233	0.327	5.381	4
237	42.462	5.093	76.410	5.260	0.631	8.892	0.173	-0.024	0.175	5.297	3
238	42.345	3.576	77.564	5.245	0.443	9.026	0.457	0.144	0.479	5.264	3
239	42.338	2.089	78.428	5.244	0.259	9.127	0.440	0.060	0.444	5.251	3

X IS DISTANCE MEASURED HORIZONTALLY FROM GROUND ZERO.
Y IS DISTANCE MEASURED VERTICALLY ABOVE GROUND ZERO, AND
T IS TIME-OF-ARRIVAL INDICATED BY THE PUFF TRAJECTORY.
VELOCITIES ARE DERIVATIVES AT THE TIME OF ARRIVAL,
AND ARE EXPRESSED IN MACH UNITS RELATIVE TO C ABOVE.
R IS A RADIUS CALCULATED ACCORDING TO REGIONS DEFINED
ON BASIS OF FIRST SHOCK FRONT PASSING. CODED USING:

1= PRIMARY FRONT FROM LOWER CHARGE
2= PRIMARY FRONT FROM UPPER CHARGE
3= MACH STEM AT GROUND SURFACE
4= MACH STEM BELOW INTERACTION PLANE
5= MACH STEM ABOVE INTERACTION PLANE

SCALED TIME= OBSERVED TIME MULTIPLIED BY (C/CO)/S, WHERE CO= 340.292 METERS/SECOND
AND SCALED DISTANCE= OBSERVED DISTANCE DIVIDED BY S= CUBE ROOT OF (W/WO)*(PO/P),
WHERE PO= 101.325 KILOPASCALS. (W, WO, AND P ARE DEFINED ABOVE.)
SCALED EVENT= STANDARD CHARGE WO IN ATMOSPHERE WHERE CO AND PO ARE AMBIENT (TO= 15 DEGREES CELSIUS).
VELOCITY EXPRESSED IN MACH UNITS IS INVARIANT UNDER SCALING.

TABLE 5.1

SHOCK FRONT DATA   DIPOLE WEST/11 WF5/295 30°   SMOKE PUFF GRID 1220   R1 /A780120
PRIMARY FRONT FROM LOWER CHARGE

AMBIENT TEMPERATURE T= -19.11 DEGREES CELSIUS
AMBIENT PRESSURE P= 94.34 KILOPASCALS
RELATIVE HUMIDITY RH= 60.0 PER CENT
VAPOUR PRESSURE VP= 0.08 KILOPASCALS
AMBIENT SPEED OF SOUND C= 319.689 METERS/SECOND
CHARGE WEIGHT W= 489.9 KILOGRAMS
CHARGE HEIGHT H= 7.31 METERS
SEPARATION #2 HS= 7.64 METERS
SACHS SCALING FACTOR S= 8.0730
SCALING TO CHARGE WEIGHT WO= 1.0 KILOGRAMS

SHOCK FRONT DATA COMPUTED FROM PARTICLE TRAJECTORY TIMES OF ARRIVAL
RFIT=A+B*T+C*LOG(1+T)+D*SQRT(LOG(1+T))
USING WEIGHT=INVERSE OF RADIUS SQUARED

T-OBS MSEC	R-OBS METERS	R-FIT METERS	DIFFERENCE METERS	T-SCAL MSEC	R-SCAL METERS	SHOCK VELOCITY	PRESSURE RATIO	PRESSURE KPA	PARTICLE VELOCITY	DENSITY RATIO	PUFF NUMBER
3.443	8.306	8.009	-0.297	0.401	0.992	3.323	11.716	1105.271	2.518	4.130	9
3.443	8.289	8.009	-0.280	0.401	0.992	3.323	11.716	1105.271	2.518	4.130	8
4.048	8.457	8.624	0.168	0.471	1.068	3.054	9.712	916.268	2.272	3.906	7
4.653	8.873	9.194	0.321	0.542	1.139	2.841	8.247	778.066	2.074	3.705	10
4.653	8.978	9.194	0.215	0.542	1.139	2.841	8.247	778.066	2.074	3.705	6
4.956	9.347	9.464	0.117	0.577	1.172	2.750	7.655	722.139	1.988	3.612	11
4.956	9.351	9.464	0.113	0.577	1.172	2.750	7.655	722.139	1.988	3.612	5
5.863	10.072	10.227	0.155	0.682	1.267	2.523	6.260	590.534	1.772	3.360	4
6.165	10.160	10.467	0.307	0.717	1.297	2.459	5.891	555.722	1.711	3.285	12
6.769	11.239	10.931	-0.308	0.788	1.354	2.347	5.257	495.976	1.600	3.145	21
6.769	11.047	10.931	-0.115	0.788	1.354	2.347	5.257	495.976	1.600	3.145	3
7.071	11.107	11.155	0.048	0.823	1.382	2.296	4.984	470.180	1.550	3.079	20
7.373	11.585	11.374	-0.210	0.858	1.409	2.249	4.734	446.646	1.504	3.017	22
7.373	11.252	11.374	0.123	0.858	1.409	2.249	4.734	446.646	1.504	3.017	19
7.675	11.885	11.589	-0.296	0.893	1.436	2.205	4.506	425.099	1.460	2.958	23
7.675	11.670	11.589	-0.081	0.893	1.436	2.205	4.506	425.099	1.460	2.958	18
8.580	12.219	12.210	-0.009	0.998	1.512	2.089	3.924	370.232	1.342	2.796	17
9.183	12.678	12.606	-0.072	1.069	1.562	2.022	3.605	340.145	1.273	2.700	16
12.194	14.431	14.426	-0.005	1.419	1.787	1.778	2.522	237.886	1.013	2.324	34
12.194	14.479	14.426	-0.053	1.419	1.787	1.778	2.522	237.886	1.013	2.324	33
12.194	14.652	14.426	-0.226	1.419	1.787	1.778	2.522	237.886	1.013	2.324	29
12.194	14.349	14.426	0.077	1.419	1.787	1.778	2.522	237.886	1.013	2.324	30
12.194	14.352	14.426	0.074	1.419	1.787	1.778	2.522	237.886	1.013	2.324	31
12.194	14.135	14.426	0.291	1.419	1.787	1.778	2.522	237.886	1.013	2.324	32
13.096	14.868	14.931	0.062	1.524	1.849	1.725	2.303	217.270	0.954	2.238	35
13.096	15.210	14.931	-0.280	1.524	1.849	1.725	2.303	217.270	0.954	2.238	28
14.598	15.517	15.740	0.223	1.699	1.950	1.649	2.006	189.237	0.869	2.114	36
15.799	16.483	16.363	-0.120	1.839	2.027	1.598	1.814	171.137	0.811	2.029	46
15.799	16.385	16.363	-0.021	1.839	2.027	1.598	1.814	171.137	0.811	2.029	45
15.799	16.872	16.363	-0.509	1.839	2.027	1.598	1.814	171.137	0.811	2.029	41
15.799	16.674	16.363	-0.311	1.839	2.027	1.598	1.814	171.137	0.811	2.029	42
15.799	16.505	16.363	-0.142	1.839	2.027	1.598	1.814	171.137	0.811	2.029	43
15.799	16.295	16.363	0.068	1.839	2.027	1.598	1.814	171.137	0.811	2.029	44
16.099	16.876	16.516	-0.360	1.873	2.046	1.587	1.771	167.094	0.797	2.010	47
17.598	17.391	17.264	-0.128	2.048	2.138	1.535	1.582	149.248	0.736	1.922	40
20.293	18.723	18.552	-0.170	2.361	2.298	1.461	1.322	124.724	0.647	1.794	59
20.293	18.486	18.552	0.067	2.361	2.298	1.461	1.322	124.724	0.647	1.794	58
20.293	18.537	18.552	0.015	2.361	2.298	1.461	1.322	124.724	0.647	1.794	54
20.293	18.508	18.552	0.044	2.361	2.298	1.461	1.322	124.724	0.647	1.794	55
20.293	18.434	18.552	0.118	2.361	2.298	1.461	1.322	124.724	0.647	1.794	56

TABLE 5.1 continued

20.293	18.276	18.552	0.277	2.361	2.298	1.461	1.322	124.724	0.647	1.794	57
20.592	18.838	18.692	-0.146	2.396	2.315	1.453	1.298	122.461	0.638	1.752	53
25.370	20.361	20.839	-0.023	2.952	2.581	1.364	1.004	94.705	0.526	1.627	71
25.370	20.826	20.839	0.012	2.952	2.581	1.364	1.004	94.705	0.526	1.627	70
25.370	20.736	20.839	0.102	2.952	2.581	1.364	1.004	94.705	0.526	1.627	67
25.370	20.595	20.839	0.243	2.952	2.581	1.364	1.004	94.705	0.526	1.627	68
25.370	20.590	20.839	0.249	2.952	2.581	1.364	1.004	94.705	0.526	1.627	69
25.668	20.850	20.968	0.118	2.967	2.597	1.360	0.990	93.378	0.520	1.619	66
31.025	22.799	23.238	0.439	3.610	2.378	1.296	0.792	74.715	0.437	1.508	82
31.025	23.054	23.238	0.184	3.610	2.378	1.296	0.792	74.715	0.437	1.508	78
31.025	22.701	23.238	0.537	3.610	2.878	1.296	0.792	74.715	0.437	1.508	79
31.025	22.562	23.238	0.676	3.610	2.378	1.296	0.792	74.715	0.437	1.508	80
31.025	22.554	23.238	0.684	3.610	2.878	1.296	0.792	74.715	0.437	1.508	81
33.103	24.428	24.093	-0.335	3.852	2.984	1.277	0.736	69.444	0.412	1.476	92
33.400	24.513	24.214	-0.300	3.887	2.999	1.275	0.729	68.758	0.408	1.471	93
33.400	24.536	24.214	-0.322	3.887	2.999	1.275	0.729	68.758	0.408	1.471	91
36.955	25.977	25.647	-0.330	4.300	3.177	1.249	0.653	61.610	0.374	1.427	105
36.955	25.974	25.647	-0.327	4.300	3.177	1.249	0.653	61.610	0.374	1.427	104
39.912	27.710	26.819	-0.891	4.645	3.322	1.232	0.603	56.886	0.350	1.397	116
			0.280 RMS								

T IS TIME OF ARRIVAL AND R IS RADIAL PUFF POSITION COMPUTED ASSUMING SHOCK FRONT SHAPE IS SPHERICAL.
SHOCK AND PARTICLE VELOCITIES ARE EXPRESSED IN MACH UNITS, RELATIVE TO THE AMBIENT SOUND SPEED C ABOVE.
PRESSURE IS PEAK OVERPRESSURE RATIO (PMAX-P)/P, AND PEAK OVERPRESSURE (PMAX-P) IN KILOPASCALS OBSERVED,
WHERE P IS AMBIENT PRESSURE. DENSITY IS EXPRESSED AS A RATIO, RELATIVE TO THE AMBIENT DENSITY D.

SCALED TIME= OBSERVED TIME MULTIPLIED BY (C/C0)/S, WHERE C0= 340.292 METERS/SECOND
AND SCALED DISTANCE= OBSERVED DISTANCE DIVIDED BY S= CUBE ROOT OF (W/W0)*(P0/P),
WHERE P0= 101.325 KILOPASCALS. (W, W0, AND P ARE DEFINED ABOVE.)
SCALED EVENT= STANDARD CHARGE W0 IN ATMOSPHERE WHERE C0 AND P0 ARE AMBIENT (T0= 15 DEGREES CELSIUS).
VELOCITY, PRESSURE, AND DENSITY, EXPRESSED AS RATIOS, ARE INVARIANT UNDER SCALING.

TABLE 5.2

SHOCK FRONT DATA   DIPOLE WEST/11 WFS/295 30°   SMOKE PUFF GRID 1220   R2 /A780120

PRIMARY FRONT FROM UPPER CHARGE

AMBIENT TEMPERATURE T= -19.11 DEGREES CELSIUS
AMBIENT PRESSURE P= 94.34 KILOPASCALS
RELATIVE HUMIDITY RH= 60.0 PER CENT
VAPOUR PRESSURE VP= 0.08 KILOPASCALS
AMBIENT SPEED OF SOUND C= 319.689 METERS/SECOND
CHARGE WEIGHT W= 489.9 KILOGRAMS
CHARGE HEIGHT H= 7.31 METERS
SEPARATION #2 HS= 7.64 METERS
SACHS SCALING FACTOR S= 8.0730
SCALING TO CHARGE WEIGHT WO= 1.0 KILOGRAMS

SHOCK FRONT DATA COMPUTED FROM PARTICLE TRAJECTORY TIMES OF ARRIVAL
RFIT=A+B*T+C*LOG(ALPHA+T), ALPHA FIXED AT 1.0
USING WEIGHT=INVERSE OF RADIUS SQUARED

T-OBS MSEC	R-OBS METERS	R-FIT METERS	DIFFERENCE METERS	T-SCAL MSEC	R-SCAL METERS	SHOCK VELOCITY	PRESSURE RATIO	PRESSURE KPA	PARTICLE VELOCITY	DENSITY RATIO	PUFF NUMBER
5.863	10.288	10.320	0.032	0.682	1.278	2.166	4.306	406.278	1.420	2.904	1
6.769	10.998	10.940	-0.058	0.788	1.355	2.113	4.041	381.247	1.366	2.830	2
9.785	12.878	12.906	0.028	1.139	1.599	1.974	3.378	318.657	1.222	2.627	13
13.998	15.434	15.469	0.035	1.629	1.916	1.841	2.790	263.169	1.082	2.425	25
16.909	17.244	17.202	-0.042	1.973	2.131	1.774	2.504	236.264	1.008	2.317	37
			0.040 RMS								

T IS TIME OF ARRIVAL AND R IS RADIAL PUFF POSITION COMPUTED ASSUMING SHOCK FRONT SHAPE IS SPHERICAL.
SHOCK AND PARTICLE VELOCITIES ARE EXPRESSED IN MACH UNITS, RELATIVE TO THE AMBIENT SOUND SPEED C ABOVE.
PRESSURE IS PEAK OVERPRESSURE RATIO (PMAX-P)/P, AND PEAK OVERPRESSURE (PMAX-P) IN KILOPASCALS OBSERVED,
WHERE P IS AMBIENT PRESSURE. DENSITY IS EXPRESSED AS A RATIO, RELATIVE TO THE AMBIENT DENSITY D.

SCALED TIME= OBSERVED TIME MULTIPLIED BY (C/CO)/S, WHERE CO= 340.292 METERS/SECOND
AND SCALED DISTANCE= OBSERVED DISTANCE DIVIDED BY S= CUBE ROOT OF (W/WO)*(PO/P),
WHERE PO= 101.325 KILOPASCALS. (W, WO, AND P ARE DEFINED ABOVE.)
SCALED EVENT= STANDARD CHARGE WO IN ATMOSPHERE WHERE CO AND PO ARE AMBIENT (TO= 15 DEGREES CELSIUS).
VELOCITY, PRESSURE, AND DENSITY, EXPRESSED AS RATIOS, ARE INVARIANT UNDER SCALING.

TABLE 5.3

SHOCK FRONT DATA   DIPOLE WEST/11 WF5/295 30'   SMOKE PUFF GRID 1220   R4 /A780120

MACH STEM BELOW INTERACTION PLANE

AMBIENT TEMPERATURE T= -19.11 DEGREES CELSIUS
AMBIENT PRESSURE P= 94.34 KILOPASCALS
RELATIVE HUMIDITY RH= 60.0 PER CENT
VAPOUR PRESSURE VP= 0.08 KILOPASCALS
AMBIENT SPEED OF SOUND C= 319.689 METERS/SECOND
CHARGE WEIGHT W= 489.9 KILOGRAMS
CHARGE HEIGHT H= 7.31 METERS
SEPARATION +2 HS= 7.64 METERS
SACHS SCALING FACTOR S= 8.0730
SCALING TO CHARGE WEIGHT WO= 1.0 KILOGRAMS

SHOCK FRONT DATA COMPUTED FROM PARTICLE TRAJECTORY TIMES OF ARRIVAL
RFIT=A+B*T+C*LOG(1+T)+D*SQRT(LOG(1+T))
USING WEIGHT=INVERSE OF RADIUS SQUARED

T-OBS MSEC	R-OBS METERS	R-FIT METERS	DIFFERENCE METERS	T-SCAL MSEC	R-SCAL METERS	SHOCK VELOCITY	PRESSURE RATIO	PRESSURE KPA	PARTICLE VELOCITY	DENSITY RATIO	PUFF NUMBER
10.358	11.618	11.693	0.074	1.209	1.448	2.466	5.929	559.316	1.717	3.293	15
13.998	14.345	14.313	-0.032	1.629	1.773	2.107	4.012	378.501	1.360	2.322	27
16.999	16.552	16.237	-0.316	1.978	2.011	1.914	3.108	293.194	1.160	2.537	39
20.592	18.597	18.337	-0.260	2.396	2.271	1.753	2.419	228.155	0.985	2.234	52
20.891	18.588	18.504	-0.083	2.431	2.292	1.742	2.374	223.930	0.973	2.266	51
25.370	20.802	20.896	0.095	2.952	2.588	1.608	1.849	174.432	0.821	2.045	63
25.668	20.971	21.049	0.078	2.987	2.607	1.600	1.822	171.865	0.813	2.033	65
25.668	20.904	21.049	0.145	2.987	2.607	1.600	1.822	171.865	0.813	2.033	64
31.025	23.149	23.693	0.544	3.610	2.935	1.494	1.438	135.687	0.688	1.852	77
31.025	22.898	23.693	0.795	3.610	2.935	1.494	1.438	135.687	0.688	1.852	75
31.025	22.905	23.693	0.788	3.610	2.935	1.494	1.438	135.687	0.688	1.852	76
33.400	24.841	24.814	-0.028	3.887	3.074	1.459	1.315	124.088	0.644	1.791	89
33.400	24.887	24.814	-0.074	3.887	3.074	1.459	1.315	124.088	0.644	1.791	87
33.400	24.809	24.814	0.005	3.887	3.074	1.459	1.315	124.088	0.644	1.791	88
33.695	25.127	24.952	-0.175	3.921	3.091	1.454	1.301	122.780	0.639	1.784	90
36.659	26.659	26.311	-0.347	4.266	3.259	1.418	1.178	111.140	0.594	1.720	102
36.659	26.195	26.311	0.117	4.266	3.259	1.418	1.178	111.140	0.594	1.720	99
36.659	26.326	26.311	-0.014	4.266	3.259	1.418	1.178	111.140	0.594	1.720	100
36.659	26.357	26.311	-0.045	4.266	3.259	1.418	1.178	111.140	0.594	1.720	101
36.955	26.738	26.445	-0.293	4.300	3.276	1.414	1.167	110.104	0.589	1.715	103
39.912	27.837	27.768	-0.069	4.645	3.440	1.384	1.068	100.797	0.551	1.662	112
40.208	28.163	27.898	-0.264	4.679	3.456	1.381	1.060	99.961	0.543	1.657	114
40.208	27.803	27.898	0.096	4.679	3.456	1.381	1.060	99.961	0.543	1.657	111
40.208	27.973	27.898	-0.075	4.679	3.456	1.381	1.060	99.961	0.543	1.657	113
41.389	28.522	28.418	-0.104	4.816	3.520	1.371	1.026	96.768	0.534	1.639	115
43.158	29.727	29.189	-0.538	5.022	3.616	1.356	0.979	92.393	0.516	1.614	127
43.158	29.192	29.189	-0.003	5.022	3.616	1.356	0.979	92.393	0.516	1.614	123
43.158	29.176	29.189	0.013	5.022	3.616	1.356	0.979	92.393	0.516	1.614	124
43.158	29.254	29.189	-0.065	5.022	3.616	1.356	0.979	92.393	0.516	1.614	125
43.158	29.619	29.189	-0.429	5.022	3.616	.356	0.979	92.393	0.516	1.614	126
45.515	30.141	30.205	0.064	5.297	3.741	1.339	0.925	87.230	0.493	1.588	128
46.692	30.985	30.707	-0.278	5.434	3.804	1.331	0.900	84.898	0.483	1.570	138
46.692	30.695	30.707	0.012	5.434	3.804	1.331	0.900	84.898	0.483	1.570	135
46.692	30.745	30.707	-0.038	5.434	3.804	1.331	0.900	84.898	0.483	1.570	136
46.692	30.899	30.707	-0.192	5.434	3.804	1.331	0.900	84.898	0.483	1.570	137
47.231	31.192	30.957	-0.235	5.502	3.835	1.327	0.888	83.789	0.478	1.563	139
48.750	31.626	31.578	-0.048	5.673	3.912	1.318	0.860	81.165	0.466	1.547	140
50.219	32.305	32.195	-0.110	5.844	3.988	1.310	0.835	78.740	0.455	1.533	148
50.219	32.272	32.195	-0.077	5.844	3.988	1.310	0.835	78.740	0.455	1.533	147
50.512	32.429	32.318	-0.111	5.878	4.003	1.308	0.830	78.277	0.453	1.530	149

TABLE 5.3 continued

51.099	32.792	32.563	-0.229	5.946	4.034	1.305	0.820	77.372	0.449	1.524	150
51.392	32.812	32.685	-0.127	5.981	4.049	1.303	0.815	76.929	0.447	1.522	151
52.565	33.156	33.173	0.017	6.117	4.109	1.297	0.797	75.224	0.439	1.511	152
54.323	34.214	33.899	-0.315	6.322	4.199	1.289	0.772	72.846	0.428	1.497	163
54.323	33.715	33.899	0.184	6.322	4.199	1.289	0.772	72.846	0.428	1.497	159
54.323	33.679	33.899	0.220	6.322	4.199	1.289	0.772	72.846	0.428	1.497	160
54.323	33.799	33.899	0.100	6.322	4.199	1.289	0.772	72.846	0.428	1.497	161
54.323	34.030	33.899	-0.131	6.322	4.199	1.289	0.772	72.846	0.428	1.497	162
54.908	34.466	34.140	-0.326	6.390	4.229	1.286	0.764	72.098	0.424	1.492	164
58.416	35.929	35.575	-0.354	6.798	4.407	1.272	0.721	68.021	0.405	1.467	176
58.416	35.615	35.575	-0.041	6.798	4.407	1.272	0.721	68.021	0.405	1.467	174
58.708	35.743	35.693	-0.049	6.832	4.421	1.271	0.718	67.710	0.403	1.465	175
59.000	35.451	35.812	0.361	6.866	4.436	1.270	0.714	67.404	0.402	1.463	171
59.000	35.385	35.812	0.427	6.866	4.436	1.270	0.714	67.404	0.402	1.463	172
59.000	35.500	35.812	0.312	6.866	4.436	1.270	0.714	67.404	0.402	1.463	173
62.498	37.504	37.225	-0.279	7.273	4.611	1.258	0.679	64.021	0.385	1.442	188
62.498	36.948	37.225	0.277	7.273	4.611	1.258	0.679	64.021	0.385	1.442	185
62.498	36.936	37.225	0.289	7.273	4.611	1.258	0.679	64.021	0.385	1.442	184
62.789	37.299	37.342	0.044	7.307	4.626	1.257	0.676	63.762	0.384	1.440	187
62.789	37.170	37.342	0.172	7.307	4.626	1.257	0.576	63.762	0.384	1.440	186
63.081	36.934	37.459	0.525	7.341	4.640	1.256	0.673	63.506	0.333	1.439	183
65.698	38.472	38.507	0.035	7.645	4.770	1.248	0.650	61.340	0.372	1.425	198
65.698	38.313	38.507	0.194	7.645	4.770	1.248	0.650	61.340	0.372	1.425	195
65.698	38.212	38.507	0.295	7.645	4.770	1.248	0.650	61.340	0.372	1.425	196
65.698	38.181	38.507	0.326	7.645	4.770	1.248	0.650	61.340	0.372	1.425	197
66.570	39.028	38.854	-0.174	7.747	4.813	1.245	0.643	60.669	0.369	1.421	200
66.570	38.770	38.854	0.084	7.747	4.813	1.245	0.643	60.669	0.369	1.421	199
68.891	39.960	39.776	-0.184	8.017	4.927	1.239	0.625	58.993	0.360	1.410	210
68.891	39.740	39.776	0.036	8.017	4.927	1.239	0.625	58.993	0.360	1.410	207
69.471	40.260	40.006	-0.254	8.084	4.955	1.238	0.621	58.598	0.358	1.408	211
69.471	39.777	40.006	0.228	8.084	4.955	1.238	0.621	58.598	0.358	1.408	209
69.761	39.937	40.120	0.183	8.118	4.970	1.237	0.619	58.403	0.357	1.406	208
71.209	40.458	40.692	0.234	8.287	5.041	1.234	0.609	57.465	0.353	1.400	212
72.945	41.222	41.376	0.154	8.489	5.125	1.230	0.598	56.406	0.347	1.393	219
73.234	41.589	41.489	-0.100	8.522	5.139	1.229	0.596	56.237	0.346	1.392	222
73.234	41.296	41.489	0.194	8.522	5.139	1.229	0.596	56.237	0.346	1.392	221
73.523	41.194	41.603	0.409	8.556	5.153	1.229	0.594	56.069	0.346	1.391	220
74.101	41.983	41.830	-0.153	8.623	5.181	1.227	0.591	55.739	0.344	1.389	224
74.390	41.761	41.943	0.182	8.657	5.195	1.227	0.589	55.576	0.343	1.388	223
76.122	43.443	42.622	-0.822	8.858	5.280	1.223	0.579	54.638	0.338	1.382	236
76.122	42.605	42.622	0.016	8.858	5.280	1.223	0.579	54.638	0.338	1.382	231
76.122	43.091	42.622	-0.469	8.858	5.280	1.223	0.579	54.638	0.338	1.382	235
76.122	42.762	42.622	-0.141	8.858	5.280	1.223	0.579	54.638	0.338	1.382	233
76.122	42.897	42.622	-0.275	8.858	5.280	1.223	0.579	54.638	0.338	1.382	234
76.410	42.729	42.734	0.005	8.892	5.293	1.223	0.578	54.487	0.337	1.381	232
			0.267 RMS								

T IS TIME OF ARRIVAL AND R IS RADIAL PUFF POSITION COMPUTED ASSUMING SHOCK FRONT SHAPE IS SPHERICAL. SHOCK AND PARTICLE VELOCITIES ARE EXPRESSED IN MACH UNITS, RELATIVE TO THE AMBIENT SOUND SPEED C ABOVE. PRESSURE IS PEAK OVERPRESSURE RATIO (PMAX-P)/P, AND PEAK OVERPRESSURE (PMAX-P) IN KILOPASCALS OBSERVED, WHERE P IS AMBIENT PRESSURE. DENSITY IS EXPRESSED AS A RATIO, RELATIVE TO THE AMBIENT DENSITY D.

SCALED TIME= OBSERVED TIME MULTIPLIED BY (C/C0)/S, WHERE C0= 340.292 METERS/SECOND AND SCALED DISTANCE= OBSERVED DISTANCE DIVIDED BY S= CUBE ROOT OF (W/W0)*(P0/P), WHERE P0= 101.325 KILOPASCALS. (W, W0, AND P ARE DEFINED ABOVE.) SCALED EVENT= STANDARD CHARGE W0 IN ATMOSPHERE WHERE C0 AND P0 ARE AMBIENT (T0= 15 DEGREES CELSIUS). VELOCITY, PRESSURE, AND DENSITY, EXPRESSED AS RATIOS, ARE INVARIANT UNDER SCALING.

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TABLE 5.4

SHOCK FRONT DATA DIPOLE WEST/11 #F5/295 30° SMOKE PUFF GRID 1220 R5 /A780120

MACH STEM ABOVE INTERACTION PLANE

AMBIENT TEMPERATURE T= -19.11 DEGREES CELSIUS
AMBIENT PRESSURE P= 94.34 KILOPASCALS
RELATIVE HUMIDITY RH= 60.0 PER CENT
VAPOUR PRESSURE VP= 0.08 KILOPASCALS
AMBIENT SPEED OF SOUND C= 319.689 METERS/SECOND
CHARGE WEIGHT W= 489.9 KILOGRAMS
CHARGE HEIGHT H= 7.31 METERS
SEPARATION ÷2 HS= 7.64 METERS
SACHS SCALING FACTOR S= 8.0730
SCALING TO CHARGE WEIGHT W0= 1.0 KILOGRAMS

SHOCK FRONT DATA COMPUTED FROM PARTICLE TRAJECTORY TIMES OF ARRIVAL
RFIT=A+B*T+C*LOG(1+T)+D*SQRT(LOG(1+T))
USING WEIGHT=INVERSE OF RADIUS SQUARED

T-OBS MSEC	R-OBS METERS	R-FIT METERS	DIFFERENCE METERS	T-SCAL MSEC	R-SCAL METERS	SHOCK VELOCITY	PRESSURE RATIO	PRESSURE KPA	PARTICLE VELOCITY	DENSITY RATIO	PUFF NUMBER
10.388	11.591	11.646	0.055	1.209	1.443	2.440	5.778	545.085	1.692	3.261	14
14.298	14.502	14.446	-0.056	1.664	1.789	2.074	3.853	363.505	1.327	2.775	26
16.999	16.423	16.163	-0.261	1.978	2.002	1.909	3.087	291.210	1.155	2.530	38
21.190	18.698	18.593	-0.105	2.466	2.303	1.730	2.326	219.397	0.960	2.247	49
21.788	18.643	18.922	0.278	2.535	2.344	1.710	2.244	211.703	0.937	2.214	50
25.370	20.859	20.818	-0.041	2.952	2.579	1.607	1.847	174.250	0.821	2.044	62
25.668	21.097	20.971	-0.126	2.987	2.598	1.600	1.820	171.676	0.812	2.032	61
31.025	22.927	23.613	0.686	3.610	2.925	1.492	1.432	135.093	0.685	1.849	74
31.025	23.161	23.613	0.452	3.610	2.925	1.492	1.432	135.093	0.685	1.849	73
33.400	24.704	24.732	0.028	3.887	3.063	1.456	1.306	123.223	0.641	1.735	86
33.400	24.919	24.732	-0.188	3.887	3.063	1.456	1.306	123.223	0.641	1.736	85
36.659	26.296	26.226	-0.070	4.266	3.249	1.414	1.164	109.856	0.588	1.713	97
36.955	26.371	26.360	-0.012	4.300	3.265	1.410	1.153	108.781	0.584	1.707	98
39.912	27.891	27.677	-0.214	4.645	3.428	1.378	1.050	99.076	0.544	1.652	110
40.208	28.015	27.807	-0.208	4.679	3.444	1.376	1.041	98.200	0.541	1.647	109
43.158	29.275	29.092	-0.183	5.022	3.604	1.349	0.956	90.236	0.506	1.601	122
43.158	29.164	29.092	-0.072	5.022	3.604	1.349	0.956	90.236	0.506	1.601	121
46.692	30.869	30.600	-0.268	5.434	3.790	1.322	0.872	82.275	0.471	1.554	134
46.692	30.818	30.600	-0.218	5.434	3.790	1.322	0.872	82.275	0.471	1.554	133
50.219	32.316	32.077	-0.239	5.844	3.973	1.299	0.802	75.558	0.441	1.514	145
50.512	32.231	32.199	-0.032	5.878	3.988	1.297	0.797	75.169	0.439	1.511	146
54.323	33.779	33.766	-0.012	6.322	4.183	1.276	0.734	69.277	0.411	1.475	158
54.323	33.794	33.766	-0.027	6.322	4.183	1.276	0.734	69.277	0.411	1.475	157
58.416	35.307	35.424	0.117	6.798	4.388	1.258	0.678	63.984	0.385	1.442	169
58.708	35.348	35.541	0.194	6.832	4.402	1.256	0.675	63.641	0.384	1.439	170
62.498	36.921	37.054	0.133	7.273	4.590	1.241	0.631	59.546	0.363	1.414	182
62.789	37.029	37.170	0.141	7.307	4.604	1.240	0.628	59.256	0.362	1.412	181
65.698	38.091	38.319	0.227	7.645	4.747	1.230	0.599	56.539	0.348	1.394	194
65.698	38.286	38.319	0.032	7.645	4.747	1.230	0.599	56.539	0.348	1.394	193
69.471	39.646	39.795	0.150	8.084	4.929	1.219	0.566	53.432	0.332	1.374	206
69.471	39.780	39.795	0.015	8.084	4.929	1.219	0.566	53.432	0.332	1.374	205
72.945	41.144	41.144	-0.000	8.489	5.096	1.209	0.540	50.923	0.319	1.358	218
73.234	41.265	41.255	-0.010	8.522	5.110	1.209	0.538	50.728	0.318	1.357	217
76.122	42.554	42.368	-0.186	8.858	5.248	1.202	0.518	48.878	0.308	1.345	229
76.410	42.567	42.479	-0.088	8.892	5.262	1.201	0.516	48.703	0.307	1.343	230
			0.201 RMS								

T IS TIME OF ARRIVAL AND R IS RADIAL PUFF POSITION COMPUTED ASSUMING SHOCK FRONT SHAPE IS SPHERICAL.
SHOCK AND PARTICLE VELOCITIES ARE EXPRESSED IN MACH UNITS, RELATIVE TO THE AMBIENT SOUND SPEED C ABOVE.
PRESSURE IS PEAK OVERPRESSURE RATIO (PMAX-P)/P, AND PEAK OVERPRESSURE (PMAX-P) IN KILOPASCALS OBSERVED,
WHERE P IS AMBIENT PRESSURE. DENSITY IS EXPRESSED AS A RATIO, RELATIVE TO THE AMBIENT DENSITY D.

SCALED TIME= OBSERVED TIME MULTIPLIED BY (C/C0)/S, WHERE C0= 340.292 METERS/SECOND
AND SCALED DISTANCE= OBSERVED DISTANCE DIVIDED BY S= CUBE ROOT OF (W/W0)*(P0/P),
WHERE P0= 101.325 KILOPASCALS. (W, W0, AND P ARE DEFINED ABOVE.)
SCALED EVENT= STANDARD CHARGE W0 IN ATMOSPHERE WHERE C0 AND P0 ARE AMBIENT (T0= 15 DEGREES CELSIUS).
VELOCITY, PRESSURE, AND DENSITY, EXPRESSED AS RATIOS, ARE INVARIANT UNDER SCALING.

TABLE 5.5

SHOCK FRONT DATA   DIPOLE WEST/11 WF5/295 30°   SMOKE PUFF GRID 1220   R3 /A780120

MACH STEM AT GROUND SURFACE

AMBIENT TEMPERATURE T= -19.11 DEGREES CELSIUS
AMBIENT PRESSURE P= 94.34 KILOPASCALS
RELATIVE HUMIDITY RH= 60.0 PER CENT
VAPOUR PRESSURE VP= 0.08 KILOPASCALS
AMBIENT SPEED OF SOUND C= 319.689 METERS/SECOND
CHARGE WEIGHT W= 489.9 KILOGRAMS
CHARGE HEIGHT H= 7.31 METERS
SEPARATION +2 HS= 7.64 METERS
SACHS SCALING FACTOR S= 8.0730
SCALING TO CHARGE WEIGHT W0= 1.0 KILOGRAMS

SHOCK FRONT DATA COMPUTED FROM PARTICLE TRAJECTORY TIMES OF ARRIVAL
RFIT=A+B*T+C*LOG(1+T)+D*SQRT(LOG(1+T))
USING WEIGHT=INVERSE OF RADIUS SQUARED

T-OBS MSEC	R-OBS METERS	R-FIT METERS	DIFFERENCE METERS	T-SCAL MSEC	R-SCAL METERS	SHOCK VELOCITY	PRESSURE RATIO	PRESSURE KPA	PARTICLE VELOCITY	DENSITY RATIO	PUFF NUMBER
17.279	16.045	16.003	-0.042	2.013	1.982	1.343	2.795	263.715	1.083	2.427	48
20.891	18.017	18.029	0.013	2.431	2.233	1.694	2.182	205.873	0.920	2.138	60
25.370	20.233	20.359	0.126	2.952	2.522	1.568	1.702	160.605	0.775	1.978	72
31.025	22.544	23.092	0.548	3.610	2.860	1.463	1.331	125.600	0.660	1.799	83
33.695	24.422	24.326	-0.096	3.921	3.013	1.427	1.209	114.064	0.605	1.736	90
33.696	24.667	24.326	-0.341	3.921	3.013	1.427	1.209	114.064	0.605	1.736	94
33.695	24.478	24.326	-0.152	3.921	3.013	1.427	1.209	114.064	0.605	1.736	95
36.955	25.828	25.793	-0.035	4.300	3.195	1.391	1.090	102.816	0.560	1.674	108
37.251	25.782	25.724	-0.058	4.335	3.211	1.388	1.080	101.920	0.555	1.668	107
37.843	26.254	26.156	-0.098	4.404	3.244	1.332	1.062	100.181	0.549	1.659	106
39.912	28.033	27.094	-0.943	4.645	3.356	1.364	1.003	94.624	0.525	1.627	117
40.798	27.484	27.480	-0.004	4.748	3.404	1.357	0.980	92.469	0.516	1.614	119
41.684	27.703	27.863	0.160	4.851	3.451	1.350	0.959	90.434	0.507	1.602	118
44.926	29.203	29.250	0.047	5.228	3.623	1.327	0.889	83.874	0.478	1.563	130
44.926	29.452	29.250	-0.202	5.228	3.623	1.327	0.889	83.874	0.478	1.563	129
46.592	29.002	29.996	0.995	5.434	3.716	1.317	0.857	80.805	0.465	1.545	131
48.163	30.452	30.613	0.161	5.605	3.792	1.309	0.832	78.473	0.454	1.531	143
48.750	30.770	30.859	0.089	5.673	3.823	1.306	0.823	77.601	0.450	1.526	142
49.338	31.024	31.104	0.080	5.741	3.853	1.303	0.814	76.752	0.446	1.521	141
50.219	31.955	31.470	-0.485	5.844	3.898	1.299	0.801	75.530	0.440	1.513	155
52.565	32.208	32.440	0.232	6.117	4.018	1.288	0.769	72.545	0.426	1.495	153
52.565	32.135	32.440	0.305	6.117	4.018	1.288	0.769	72.545	0.426	1.495	154
54.908	33.524	33.402	-0.123	6.390	4.137	1.279	0.741	69.910	0.414	1.479	168
54.908	33.476	33.402	-0.075	6.390	4.137	1.279	0.741	69.910	0.414	1.479	167
56.078	33.981	33.879	-0.102	6.526	4.197	1.274	0.728	68.707	0.408	1.471	165
56.078	33.757	33.879	0.123	6.526	4.197	1.274	0.728	68.707	0.408	1.471	166
58.738	35.443	34.947	-0.496	6.832	4.329	1.266	0.702	66.246	0.396	1.456	177
59.875	35.212	35.418	0.206	6.968	4.387	1.262	0.692	65.250	0.391	1.450	178
61.041	35.256	35.888	0.632	7.103	4.445	1.259	0.682	64.309	0.387	1.444	179
62.493	36.555	36.474	-0.082	7.273	4.518	1.255	0.670	63.203	0.381	1.437	191
62.493	36.929	36.474	-0.455	7.273	4.518	1.255	0.670	63.203	0.381	1.437	189
62.789	36.755	36.590	-0.165	7.307	4.532	1.254	0.668	62.990	0.380	1.435	190
65.408	37.584	37.537	-0.047	7.511	4.602	1.247	0.649	61.203	0.371	1.424	201
66.570	38.097	38.100	0.003	7.747	4.719	1.245	0.641	60.474	0.368	1.419	202
69.761	38.085	39.366	1.281	8.118	4.876	1.238	0.622	58.654	0.359	1.408	203
70.340	39.937	39.596	-0.342	8.186	4.905	1.237	0.618	58.349	0.357	1.406	213
71.498	39.539	40.053	0.514	8.320	4.961	1.235	0.612	57.762	0.354	1.402	215
73.234	41.292	40.738	-0.555	8.522	5.046	1.232	0.603	56.934	0.350	1.397	225
73.523	41.073	40.851	-0.222	8.556	5.060	1.231	0.602	56.802	0.349	1.396	226
74.390	40.984	41.192	0.209	8.657	5.102	1.230	0.598	56.414	0.347	1.394	227
75.410	42.766	41.986	-0.781	8.892	5.201	1.227	0.589	55.563	0.343	1.388	237
77.564	42.496	42.438	-0.058	9.026	5.257	1.225	0.584	55.107	0.341	1.385	238
78.423	42.389	42.776	0.387	9.127	5.299	1.224	0.581	54.779	0.339	1.383	239
			0.416 RMS								

T IS TIME OF ARRIVAL AND R IS RADIAL PUFF POSITION COMPUTED ASSUMING SHOCK FRONT SHAPE IS SPHERICAL.
SHOCK AND PARTICLE VELOCITIES ARE EXPRESSED IN MACH UNITS, RELATIVE TO THE AMBIENT SOUND SPEED C ABOVE.
PRESSURE IS PEAK OVERPRESSURE RATIO (PMAX-P)/P, AND PEAK OVERPRESSURE (PMAX-P) IN KILOPASCALS OBSERVED,
WHERE P IS AMBIENT PRESSURE. DENSITY IS EXPRESSED AS A RATIO, RELATIVE TO THE AMBIENT DENSITY D.

SCALED TIME= OBSERVED TIME MULTIPLIED BY (C/C0)/S, WHERE C0= 340.292 METERS/SECOND
AND SCALED DISTANCE= OBSERVED DISTANCE DIVIDED BY S= CUBE ROOT OF (W/W0)*(P0/P),
WHERE P0= 101.325 KILOPASCALS. (W, W0, AND P ARE DEFINED ABOVE.)
SCALED EVENT= STANDARD CHARGE W0 IN ATMOSPHERE WHERE C0 AND P0 ARE AMBIENT (T0= 15 DEGREES CELSIUS).
VELOCITY, PRESSURE, AND DENSITY, EXPRESSED AS RATIOS, ARE INVARIANT UNDER SCALING.

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TABLE 7.1

VELOCITY FIELD   DIPOLE WEST/11   WF5/295   30°   SMOKE PUFF GRID 1220   /A730120

PARTICLE VELOCITIES AT SCALED TIME= 1.000 MS

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
1.222	2.050	1.22	-0.52	1.324	1.433	2
1.178	1.917	1.31	-0.44	1.381	1.180	5
1.166	1.796	1.28	0.37	1.331	1.467	1
1.203	1.657	1.27	0.53	1.375	1.419	1
1.251	1.517	1.24	0.46	1.323	1.393	1
1.305	1.309	1.12	0.33	1.163	1.367	1
1.310	1.092	0.87	0.07	0.871	1.324	1
1.295	0.627	1.18	-0.11	1.190	1.298	1
1.254	0.566	0.98	-0.54	1.117	1.308	1
1.240	0.352	0.99	-0.53	1.128	1.354	1

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
1.155	0.183	1.10	-0.46	1.189	1.362	1
1.089	0.034	1.21	-0.50	1.309	1.395	1
1.423	1.408	1.26	0.67	1.430	1.514	1
1.465	1.240	1.44	0.39	1.495	1.504	1
1.473	1.025	1.50	0.30	1.526	1.478	1
1.477	0.842	1.43	-0.14	1.441	1.479	1
1.451	0.625	1.24	-0.25	1.266	1.477	1
1.425	0.462	1.05	-0.36	1.109	1.492	1
1.367	0.270	0.86	-0.52	1.003	1.508	1

PARTICLE VELOCITIES AT SCALED TIME= 2.000 MS

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
1.535	2.029	0.55	0.13	0.542	1.717	2
1.451	1.915	0.37	0.11	0.384	1.462	5
1.460	1.817	0.45	-0.07	0.463	1.460	4
1.520	1.661	0.55	-0.18	0.583	1.697	1
1.556	1.524	0.60	-0.18	0.627	1.675	1
1.562	1.324	0.60	-0.13	0.615	1.617	1
1.515	1.033	0.63	-0.08	0.632	1.525	1
1.530	0.813	0.48	-0.02	0.481	1.532	1
1.506	0.541	0.59	0.14	0.611	1.550	1
1.510	0.335	0.69	0.21	0.723	1.613	1
1.462	0.133	0.81	0.14	0.826	1.649	1
1.737	2.050	0.75	0.05	0.749	1.891	2
1.711	1.914	0.85	-0.16	0.868	1.713	5
1.753	1.779	0.93	0.08	0.935	1.754	4
1.735	1.655	0.81	0.00	0.813	1.890	1
1.759	1.476	0.73	-0.08	0.738	1.849	1
1.758	1.285	0.58	-0.07	0.587	1.798	1
1.727	1.056	0.50	-0.03	0.506	1.734	1
1.714	0.819	0.45	-0.00	0.449	1.716	1
1.500	0.613	0.54	0.11	0.550	1.627	1
1.591	0.396	0.64	-0.01	0.641	1.766	1
1.589	0.179	0.88	0.02	0.880	1.838	1

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
1.919	2.118	0.92	-0.05	0.921	2.036	2
1.941	1.964	1.21	0.07	1.213	1.945	5
1.944	1.774	1.23	-0.05	1.227	1.945	4
1.894	1.601	0.85	0.04	0.853	2.018	1
1.915	1.408	0.77	0.04	0.757	1.980	1
1.927	1.220	0.64	0.07	0.644	1.952	1
1.960	1.018	0.51	0.06	0.515	1.963	1
1.933	0.873	0.58	0.02	0.580	1.938	1
1.949	0.671	0.53	-0.11	0.545	1.965	1
1.881	0.425	0.63	-0.07	0.687	1.941	1
1.375	0.242	0.73	-0.16	0.799	1.990	1
1.855	0.082	0.91	-0.20	0.935	1.857	3
2.033	2.137	0.82	-0.16	0.830	2.142	2
2.040	1.949	1.04	0.02	1.037	2.042	5
2.055	1.770	0.89	-0.16	0.905	2.057	4
2.056	1.405	0.57	0.08	0.577	2.116	1
2.080	1.228	0.69	0.10	0.701	2.105	1
2.091	1.049	0.83	0.00	0.826	2.096	1
2.072	0.853	0.82	-0.06	0.825	2.072	1
2.067	0.657	0.80	-0.12	0.805	2.082	1
2.023	0.475	0.55	-0.21	0.586	2.073	1
2.031	0.300	0.61	-0.29	0.574	2.119	1

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
VELOCITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 7.2

VELOCITY FIELD   DIPOLE WEST/11   WF5/295   30°   SMOKE PUFF GRID 1220   /A780120

PARTICLE VELOCITIES AT SCALED TIME= 3.000 MS

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
1.520	2.053	0.11	0.00	0.110	1.783	2
1.513	1.923	0.10	-0.02	0.102	1.514	5
1.549	1.811	0.19	0.05	0.195	1.549	4
1.626	1.646	0.19	0.13	0.232	1.786	1
1.697	1.498	0.28	0.09	0.295	1.797	1
1.745	1.295	0.43	0.03	0.427	1.788	1
1.741	1.063	0.56	-0.01	0.556	1.748	1
1.734	0.816	0.23	0.16	0.281	1.737	1
1.751	0.592	0.92	0.89	1.279	1.779	1
1.679	0.363	0.49	-0.17	0.521	1.764	1
1.967	1.605	0.37	0.07	0.379	1.968	4
1.909	1.655	0.26	0.05	0.269	1.919	4
1.951	1.449	0.41	-0.01	0.415	2.025	1
1.948	1.246	0.53	-0.08	0.537	1.978	1
1.934	1.043	0.66	-0.02	0.656	1.939	1
1.932	0.830	0.73	0.03	0.778	1.933	1
1.388	0.419	0.50	0.06	0.505	1.950	1
1.897	0.213	0.32	0.05	0.328	2.019	1
2.154	2.141	0.50	0.06	0.500	2.183	5
2.270	1.993	0.72	0.07	0.724	2.274	5
2.277	1.771	0.74	-0.01	0.743	2.278	4
2.124	1.601	0.44	0.02	0.443	2.139	4
2.132	1.392	0.50	-0.06	0.505	2.137	1
2.118	1.206	0.55	-0.09	0.559	2.140	1
2.141	1.016	0.57	-0.06	0.569	2.144	1
2.117	0.875	0.60	-0.01	0.603	2.117	1
2.119	0.663	0.57	0.03	0.576	2.133	1
2.085	0.447	0.51	0.09	0.523	2.135	1
2.096	0.255	0.52	0.12	0.528	2.194	1
2.106	0.071	0.76	0.17	0.782	2.108	3
2.316	2.159	0.66	0.10	0.668	2.336	5
2.367	1.969	0.74	0.09	0.741	2.370	5
2.383	1.760	0.81	0.01	0.812	2.384	4

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
2.291	1.576	0.62	-0.02	0.619	2.307	4
2.315	1.413	0.68	-0.05	0.682	2.370	1
2.291	1.237	0.57	-0.08	0.573	2.314	1
2.275	1.062	0.50	-0.03	0.499	2.281	1
2.244	0.856	0.51	0.01	0.506	2.244	1
2.230	0.648	0.45	0.02	0.453	2.245	1
2.224	0.450	0.57	0.02	0.571	2.270	1
2.251	0.284	0.60	0.05	0.603	2.335	1
2.239	0.090	0.62	0.19	0.650	2.241	3
2.494	2.187	0.94	0.18	0.954	2.517	5
2.477	1.961	0.89	0.06	0.896	2.479	5
2.475	1.757	0.83	-0.02	0.825	2.477	4
2.472	1.558	0.80	-0.10	0.805	2.490	4
2.435	1.375	0.82	0.11	0.826	2.480	1
2.425	1.228	0.68	0.07	0.682	2.447	1
2.422	1.051	0.42	0.06	0.423	2.425	1
2.415	0.841	0.38	0.05	0.385	2.417	1
2.385	0.639	0.36	0.02	0.351	2.399	1
2.377	0.498	0.49	0.03	0.493	2.412	1
2.373	0.272	0.56	0.00	0.563	2.456	1
2.390	0.118	0.80	-0.02	0.796	2.393	3
2.597	2.180	0.97	0.13	0.978	2.618	5
2.598	1.984	1.07	-0.01	1.072	2.601	5
2.595	1.814	1.16	-0.08	1.160	2.596	4
2.582	1.596	1.15	-0.06	1.156	2.595	4
2.566	1.415	1.05	-0.09	1.055	2.602	4
2.563	1.246	0.74	0.03	0.743	2.586	1
2.583	1.042	1.01	-0.13	1.013	2.587	1
2.567	0.873	0.91	-0.10	0.918	2.567	1
2.566	0.698	1.18	-0.28	1.216	2.574	1
2.558	0.510	0.50	-0.18	0.533	2.588	1
2.528	0.317	0.68	-0.20	0.707	2.596	1
2.514	0.119	0.64	-0.12	0.650	2.515	3

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
VELOCITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 7.3

VELOCITY FIELD   DIPOLE WEST/11   WF5/295   30'   SMOKE PUFF GRID 1220   /A730120

PARTICLE VELOCITIES AT SCALED TIME=   4.000 MS

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
1.689	2.059	0.32	0.09	0.335	1.844	2
1.595	1.948	0.35	0.20	0.400	1.598	5
1.543	1.838	0.35	0.08	0.356	1.643	4
1.715	1.718	0.36	0.18	0.401	1.720	4
1.785	1.569	0.29	0.21	0.357	1.905	1
1.831	1.349	0.14	0.19	0.236	1.884	1
1.820	1.073	-0.03	0.04	0.049	1.827	1
2.053	1.834	0.21	0.12	0.241	2.053	4
1.979	1.700	0.24	0.18	0.304	1.985	4
2.054	1.480	0.21	0.16	0.270	2.133	1
2.082	1.263	0.21	0.15	0.257	2.112	1
2.090	1.045	0.18	0.03	0.181	2.095	1
2.017	0.397	0.25	-0.17	0.300	2.080	1
1.982	0.193	0.44	0.01	0.442	2.106	1
2.263	2.135	0.13	-0.06	0.144	2.281	5
2.439	2.003	0.30	-0.01	0.304	2.444	5
2.455	1.763	0.33	-0.01	0.329	2.457	4
2.220	1.627	0.20	0.12	0.234	2.232	4
2.262	1.394	0.28	0.08	0.294	2.314	1
2.284	1.195	0.36	0.05	0.363	2.303	1
2.327	0.996	0.43	-0.02	0.435	2.328	1
2.320	0.866	0.48	-0.03	0.477	2.320	1
2.311	0.663	0.45	-0.07	0.456	2.324	1
2.215	0.444	0.21	-0.07	0.221	2.262	1
2.235	0.259	0.31	-0.13	0.333	2.326	1
2.456	2.168	0.20	-0.03	0.204	2.477	5
2.541	1.990	0.37	0.01	0.368	2.545	5
2.569	1.755	0.34	-0.03	0.340	2.571	4
2.462	1.389	0.23	-0.03	0.232	2.509	1
2.461	1.207	0.41	-0.02	0.412	2.479	1
2.459	1.037	0.50	-0.05	0.507	2.462	1
2.445	0.847	0.56	-0.04	0.563	2.446	1
2.409	0.646	0.51	-0.05	0.512	2.423	1
2.388	0.453	0.36	-0.05	0.363	2.431	1
2.417	0.291	0.38	-0.03	0.378	2.493	1
2.731	2.229	0.49	0.07	0.491	2.757	5
2.686	1.973	0.40	0.01	0.402	2.689	5
2.694	1.752	0.46	-0.02	0.461	2.696	4
2.688	1.530	0.48	-0.05	0.481	2.707	4
2.626	1.235	0.45	-0.01	0.452	2.647	1

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
2.595	1.021	0.56	-0.04	0.559	2.598	1
2.591	0.829	0.64	-0.05	0.645	2.592	1
2.555	0.637	0.49	-0.01	0.493	2.570	1
2.530	0.499	0.42	-0.06	0.425	2.562	1
2.538	0.234	0.41	0.01	0.410	2.554	3
2.849	2.220	0.53	0.09	0.542	2.872	5
2.859	1.992	0.52	0.04	0.526	2.863	5
2.863	1.802	0.51	-0.01	0.513	2.863	4
2.847	1.565	0.51	-0.09	0.522	2.861	4
2.802	1.376	0.45	-0.09	0.465	2.842	4
2.761	1.218	0.46	-0.11	0.471	2.778	1
2.752	1.023	0.43	-0.15	0.455	2.755	1
2.735	0.868	0.73	-0.11	0.739	2.735	1
2.715	0.688	0.56	0.14	0.581	2.723	1
2.742	0.502	0.53	0.02	0.526	2.772	1
2.730	0.302	0.51	0.01	0.513	2.746	3
2.725	0.117	0.58	0.05	0.586	2.728	3
2.988	2.184	0.83	0.11	0.833	3.006	5
2.968	1.958	0.79	0.06	0.788	2.970	5
2.975	1.750	0.83	-0.10	0.841	2.978	4
2.952	1.594	0.77	-0.10	0.773	2.963	4
2.940	1.393	0.73	-0.13	0.743	2.976	4
2.945	1.233	0.69	-0.13	0.704	3.009	4
2.891	1.039	0.60	-0.05	0.599	2.894	1
2.863	0.868	0.23	-0.01	0.234	2.863	1
2.854	0.666	0.55	-0.05	0.550	2.864	1
2.884	0.514	0.61	-0.01	0.613	2.910	1
2.865	0.304	0.59	-0.04	0.595	2.881	3
3.110	2.152	0.91	0.14	0.923	3.124	5
3.093	1.946	0.84	0.07	0.845	3.094	5
3.117	1.760	0.87	0.05	0.875	3.118	4
3.089	1.584	0.68	-0.02	0.682	3.100	4
3.074	1.395	0.75	-0.11	0.758	3.108	4
3.065	1.211	0.69	-0.13	0.708	3.132	4
3.054	1.037	0.46	-0.08	0.471	3.057	1
3.041	0.865	0.34	0.00	0.344	3.041	1
3.046	0.675	0.46	-0.04	0.463	3.054	1
3.029	0.494	0.53	-0.01	0.529	3.069	3
3.030	0.300	0.47	-0.06	0.476	3.044	3
3.034	0.112	0.42	-0.00	0.421	3.036	3

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
VELOCITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 7.4

VELOCITY FIELD   DIPOLE WEST/11   WF5/295   30°   SMOKE PUFF GRID 1220   /A780120

PARTICLE VELOCITIES AT SCALED TIME=   5.000 MS

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
2.307	2.124	0.24	0.01	0.241	2.323	5	3.121	1.579	0.32	-0.01	0.322	3.132	4
2.518	2.003	0.26	0.05	0.267	2.523	5	3.137	1.368	0.44	-0.02	0.443	3.174	4
2.548	1.775	0.35	0.09	0.363	2.549	4	3.112	1.213	0.37	-0.00	0.372	3.177	4
2.292	1.668	0.19	0.10	0.218	2.299	4	3.067	1.022	0.43	-0.02	0.428	3.069	1
2.333	1.434	0.13	0.11	0.171	2.392	1	3.026	0.846	0.44	-0.05	0.441	3.027	1
2.352	1.223	0.13	0.04	0.132	2.374	1	3.031	0.654	0.45	-0.03	0.453	3.042	1
2.409	1.007	0.13	0.04	0.138	2.411	1	3.064	0.508	0.45	-0.04	0.453	3.105	3
2.406	0.862	0.14	0.04	0.144	2.406	1	3.022	0.296	0.37	-0.04	0.375	3.037	3
2.395	0.631	0.17	0.01	0.173	2.414	1	3.323	2.180	0.42	0.04	0.418	3.339	5
2.314	0.216	0.15	0.08	0.171	2.414	1	3.233	1.956	0.38	0.01	0.381	3.290	5
2.499	2.163	0.12	0.01	0.117	2.519	5	3.320	1.758	0.40	-0.03	0.401	3.321	4
2.654	1.986	0.26	0.02	0.257	2.658	5	3.265	1.567	0.40	-0.05	0.400	3.277	4
2.671	1.756	0.33	0.06	0.332	2.673	4	3.258	1.357	0.40	-0.05	0.399	3.293	4
2.538	1.412	0.30	0.14	0.329	2.575	4	3.254	1.178	0.45	-0.05	0.451	3.323	4
2.558	1.236	0.16	0.11	0.199	2.580	1	3.211	1.015	0.45	-0.05	0.448	3.213	1
2.571	1.048	0.18	0.06	0.185	2.575	1	3.198	0.852	0.49	-0.05	0.497	3.199	1
2.563	0.839	0.18	-0.00	0.185	2.564	1	3.200	0.666	0.44	-0.03	0.440	3.209	1
2.521	0.620	0.17	-0.05	0.181	2.537	1	3.203	0.433	0.47	-0.04	0.475	3.240	3
2.464	0.417	0.13	-0.09	0.159	2.512	1	3.185	0.297	0.42	-0.01	0.423	3.199	3
2.518	0.271	0.23	-0.09	0.247	2.533	3	3.202	0.105	0.47	-0.00	0.474	3.203	3
2.849	2.243	0.24	0.02	0.244	2.876	5	3.409	2.157	0.53	0.08	0.537	3.422	5
2.785	1.977	0.22	0.02	0.219	2.783	5	3.415	1.948	0.46	0.02	0.462	3.417	5
2.805	1.748	0.22	0.00	0.224	2.807	4	3.409	1.765	0.47	-0.03	0.474	3.410	4
2.812	1.524	0.28	0.02	0.279	2.831	4	3.418	1.580	0.49	-0.04	0.489	3.429	4
2.738	1.022	0.27	0.02	0.275	2.741	1	3.387	1.378	0.49	-0.05	0.492	3.420	4
2.748	0.818	0.31	-0.02	0.310	2.750	1	3.376	1.158	0.51	-0.08	0.516	3.446	4
2.634	0.622	0.27	-0.06	0.280	2.699	1	3.322	1.011	0.47	-0.06	0.472	3.427	4
2.663	0.461	0.35	-0.14	0.375	2.700	1	3.316	0.832	0.47	-0.04	0.476	3.316	1
2.655	0.267	0.28	-0.08	0.294	2.669	3	3.322	0.671	0.53	-0.05	0.537	3.389	3
2.980	2.239	0.27	0.03	0.270	3.005	5	3.314	0.474	0.47	-0.02	0.466	3.348	3
2.990	2.000	0.28	0.01	0.281	2.993	5	3.325	0.293	0.48	0.00	0.479	3.338	3
2.993	1.802	0.29	0.01	0.294	2.993	4	3.528	2.136	0.57	0.07	0.572	3.540	5
2.982	1.549	0.32	0.00	0.319	2.997	4	3.536	1.958	0.61	0.07	0.613	3.537	5
2.924	1.368	0.29	0.03	0.295	2.964	4	3.509	1.761	0.55	0.00	0.545	3.510	4
2.892	1.201	0.32	0.02	0.323	2.907	1	3.503	1.555	0.51	-0.01	0.510	3.516	4
2.920	1.018	0.36	0.01	0.364	2.923	1	3.488	1.373	0.47	-0.09	0.480	3.520	4
2.927	0.843	0.42	-0.04	0.420	2.928	1	3.486	1.139	0.51	-0.14	0.531	3.548	4
2.891	0.669	0.35	-0.05	0.351	2.900	1	3.471	1.008	0.60	-0.12	0.610	3.572	4
2.894	0.495	0.36	-0.07	0.361	2.923	1	3.462	0.841	0.40	-0.06	0.405	3.462	1
2.879	0.292	0.36	-0.08	0.371	2.893	3	3.439	0.661	0.36	-0.02	0.363	3.502	3
3.163	2.206	0.31	0.03	0.315	3.183	5	3.423	0.479	0.48	0.03	0.480	3.456	3
3.135	1.962	0.30	-0.01	0.303	3.137	5	3.433	0.297	0.47	0.01	0.473	3.446	3
3.148	1.731	0.31	-0.02	0.310	3.150	4							

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
VELOCITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

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TABLE 7.5

VELOCITY FIELD DIPOLE WEST/11 WF5/295 30° SMOKE PUFF GRID 1220 /A780120

PARTICLE VELOCITIES AT SCALED TIME= 6.000 MS

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
2.916	2.251	0.19	0.04	0.189	2.945	5
2.853	1.988	0.20	0.05	0.205	2.857	5
2.873	1.757	0.21	0.05	0.213	2.874	4
2.893	1.539	0.21	0.06	0.222	2.910	4
2.796	1.031	0.10	0.03	0.109	2.799	1
2.820	0.818	0.14	0.01	0.139	2.821	1
2.753	0.605	0.15	-0.03	0.152	2.769	1
2.755	0.428	0.19	-0.03	0.188	2.796	1
2.734	0.252	0.19	0.02	0.185	2.745	3
3.051	2.245	0.18	0.02	0.178	3.077	5
3.070	2.005	0.21	0.03	0.213	3.074	5
3.080	1.808	0.23	0.04	0.233	3.080	4
3.077	1.562	0.25	0.06	0.253	3.091	4
3.009	1.390	0.20	0.08	0.212	3.044	4
2.982	1.222	0.21	0.08	0.221	3.048	4
3.003	1.024	0.15	0.02	0.149	3.005	1
3.032	0.837	0.22	0.01	0.216	3.033	1
2.975	0.657	0.17	-0.01	0.172	2.986	1
2.985	0.473	0.19	-0.03	0.191	3.022	3
2.976	0.263	0.21	-0.07	0.221	2.988	3
3.248	2.215	0.22	0.03	0.223	3.268	5
3.218	1.963	0.21	0.03	0.214	3.220	5
3.235	1.735	0.25	0.04	0.251	3.240	4
3.211	1.582	0.24	0.02	0.241	3.223	4
3.252	1.372	0.25	0.03	0.250	3.287	4
3.221	1.222	0.27	0.05	0.276	3.282	4
3.179	1.025	0.24	0.03	0.233	3.181	1
3.141	0.837	0.25	-0.00	0.245	3.142	1
3.150	0.642	0.25	-0.03	0.249	3.161	1
3.191	0.486	0.30	-0.07	0.305	3.228	3
3.133	0.276	0.28	-0.06	0.290	3.145	3
3.429	2.190	0.24	0.02	0.245	3.446	5
3.387	1.961	0.24	0.03	0.237	3.389	5
3.426	1.755	0.26	0.02	0.257	3.427	4
3.378	1.561	0.29	0.02	0.283	3.391	4
3.372	1.365	0.30	0.03	0.297	3.407	4
3.383	1.169	0.32	0.00	0.321	3.452	4
3.346	1.007	0.33	-0.00	0.334	3.451	4
3.342	0.839	0.33	-0.02	0.332	3.343	1
3.336	0.652	0.35	-0.05	0.352	3.399	3
3.343	0.464	0.35	-0.08	0.355	3.375	3
3.314	0.284	0.34	-0.05	0.344	3.327	3
3.548	2.177	0.31	0.04	0.314	3.563	5
3.530	1.949	0.26	0.01	0.257	3.531	5
3.528	1.758	0.28	0.00	0.276	3.529	4
3.542	1.569	0.29	-0.00	0.291	3.553	4
3.521	1.366	0.32	-0.01	0.324	3.554	4

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
3.523	1.142	0.37	-0.02	0.373	3.596	4
3.466	1.002	0.36	-0.00	0.358	3.588	4
3.467	0.822	0.37	-0.03	0.376	3.468	1
3.488	0.651	0.40	-0.05	0.400	3.548	3
3.463	0.456	0.39	-0.06	0.395	3.493	3
3.473	0.283	0.40	-0.05	0.399	3.485	3
3.672	2.150	0.31	0.03	0.314	3.684	5
3.693	1.966	0.35	0.01	0.345	3.695	5
3.659	1.757	0.32	-0.01	0.320	3.652	4
3.644	1.545	0.34	-0.01	0.342	3.657	4
3.627	1.356	0.36	-0.01	0.357	3.661	4
3.643	1.164	0.40	-0.02	0.405	3.707	4
3.643	0.978	0.42	-0.05	0.422	3.746	4
3.645	0.820	0.53	-0.05	0.530	3.788	4
3.593	0.644	0.46	-0.06	0.466	3.655	3
3.579	0.465	0.43	-0.07	0.431	3.609	3
3.582	0.286	0.40	-0.05	0.406	3.593	3
3.765	2.164	0.36	0.03	0.365	3.776	5
3.800	1.951	0.38	-0.00	0.376	3.802	5
3.782	1.740	0.37	-0.01	0.368	3.784	4
3.783	1.549	0.40	-0.03	0.402	3.800	4
3.742	1.363	0.40	-0.02	0.401	3.774	4
3.766	1.209	0.42	-0.04	0.423	3.820	4
3.725	0.997	0.47	-0.02	0.475	3.822	4
3.729	0.816	0.51	-0.04	0.509	3.870	4
3.713	0.642	0.52	-0.09	0.527	3.773	3
3.705	0.469	0.50	-0.07	0.506	3.734	3
3.676	0.287	0.43	-0.01	0.433	3.687	3
3.906	2.118	0.43	0.02	0.430	3.915	5
3.926	1.930	0.45	-0.00	0.447	3.926	5
3.893	1.735	0.42	-0.02	0.419	3.895	4
3.902	1.565	0.47	0.01	0.475	3.913	4
3.897	1.372	0.48	-0.05	0.480	3.927	4
3.875	1.138	0.48	-0.05	0.487	3.931	4
3.856	1.017	0.53	-0.06	0.530	3.945	4
3.843	0.814	0.53	-0.10	0.544	3.981	4
3.839	0.666	0.60	-0.05	0.599	3.897	3
3.831	0.494	0.45	-0.05	0.458	3.863	3
3.824	0.239	0.45	-0.00	0.447	3.834	3
4.027	2.117	0.58	0.04	0.584	4.036	5
4.018	1.917	0.59	0.05	0.589	4.018	5
4.027	1.723	0.56	-0.03	0.563	4.029	4
4.015	1.522	0.48	-0.10	0.489	4.028	4
4.001	1.341	0.41	-0.04	0.406	4.034	4
4.013	1.176	0.42	-0.16	0.446	4.070	4
3.976	0.993	0.39	-0.28	0.481	4.067	4
3.955	0.241	0.09	0.17	0.195	3.963	3

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
VELOCITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 7.6

VELOCITY FIELD   DIPOLE WEST/11   WF5/295   30°   SMOKE PUFF GRID 1220   /A780120

PARTICLE VELOCITIES AT SCALED TIME=   7.000 MS

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
2.982	2.272	0.19	0.08	0.201	3.011	5
2.920	2.010	0.18	0.07	0.192	2.924	5
2.951	1.779	0.23	0.07	0.238	2.952	4
2.962	1.554	0.18	0.02	0.182	2.977	4
2.834	1.042	0.14	0.04	0.143	2.837	1
2.860	0.829	0.12	0.05	0.133	2.861	1
2.796	0.612	0.12	0.08	0.142	2.811	1
2.794	0.449	0.07	0.12	0.140	2.831	1
2.785	0.286	0.12	0.15	0.190	2.799	3
3.111	2.259	0.18	0.07	0.191	3.138	5
3.140	2.024	0.20	0.08	0.211	3.144	5
3.150	1.827	0.18	0.07	0.193	3.150	4
3.147	1.580	0.16	0.03	0.165	3.159	4
3.054	1.407	0.07	0.02	0.068	3.085	4
3.033	1.239	0.10	0.01	0.098	3.094	4
3.038	1.033	0.09	0.03	0.092	3.041	1
3.087	0.846	0.13	0.04	0.132	3.088	1
3.019	0.662	0.10	0.04	0.105	3.028	1
3.033	0.492	0.11	0.14	0.178	3.072	3
3.025	0.263	0.09	0.07	0.115	3.037	3
3.320	2.228	0.20	0.05	0.204	3.342	5
3.287	1.979	0.19	0.06	0.198	3.289	5
3.317	1.752	0.20	0.06	0.205	3.318	4
3.287	1.594	0.20	0.05	0.205	3.298	4
3.316	1.386	0.15	0.04	0.155	3.349	4
3.291	1.238	0.12	0.04	0.131	3.347	4
3.233	1.039	0.10	0.04	0.106	3.334	4
3.199	0.841	0.11	0.03	0.110	3.200	1
3.208	0.642	0.12	0.04	0.124	3.219	1
3.266	0.476	0.15	0.03	0.155	3.301	3
3.212	0.266	0.17	0.02	0.173	3.223	3
3.502	2.200	0.19	0.04	0.195	3.519	5
3.460	1.974	0.20	0.05	0.204	3.462	5
3.505	1.770	0.21	0.06	0.219	3.505	4
3.465	1.575	0.22	0.05	0.228	3.476	4
3.463	1.379	0.24	0.05	0.241	3.495	4
3.476	1.175	0.22	0.02	0.224	3.541	4
3.432	1.011	0.16	0.02	0.165	3.533	4
3.423	0.840	0.16	0.02	0.157	3.424	1
3.431	0.641	0.20	-0.01	0.201	3.490	3
3.437	0.445	0.21	-0.01	0.210	3.465	3
3.415	0.277	0.24	0.02	0.241	3.427	3
3.632	2.190	0.20	0.04	0.202	3.648	5
3.608	1.959	0.21	0.05	0.219	3.610	5
3.614	1.769	0.24	0.06	0.243	3.615	4
3.632	1.580	0.24	0.06	0.248	3.642	4
3.617	1.372	0.25	0.04	0.248	3.649	4
3.630	1.143	0.24	0.02	0.245	3.698	4
3.559	1.004	0.19	0.01	0.193	3.659	4
3.562	0.815	0.19	-0.01	0.191	3.710	4
3.584	0.637	0.18	-0.02	0.185	3.640	3
3.573	0.441	0.25	-0.01	0.251	3.600	3
3.594	0.271	0.31	-0.01	0.306	3.604	3
3.758	2.160	0.21	0.03	0.211	3.771	5
3.786	1.972	0.22	0.03	0.220	3.738	5
3.743	1.764	0.24	0.05	0.239	3.744	4
3.745	1.552	0.26	0.05	0.263	3.757	4
3.732	1.360	0.26	0.03	0.260	3.764	4

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
3.758	1.166	0.27	0.02	0.273	3.820	4
3.759	0.971	0.27	-0.01	0.265	3.861	4
3.779	0.810	0.26	-0.01	0.263	3.920	4
3.720	0.628	0.25	-0.02	0.253	3.773	3
3.704	0.450	0.30	-0.01	0.301	3.731	3
3.706	0.273	0.32	-0.01	0.319	3.716	3
3.862	2.172	0.23	0.02	0.229	3.875	5
3.900	1.953	0.24	0.02	0.236	3.902	5
3.883	1.742	0.25	0.03	0.246	3.865	4
3.898	1.548	0.27	0.02	0.258	3.910	4
3.853	1.364	0.28	0.02	0.279	3.888	4
3.890	1.206	0.30	0.01	0.304	3.943	4
3.860	0.994	0.30	-0.00	0.296	3.954	4
3.864	0.810	0.29	-0.00	0.290	4.002	4
3.867	0.623	0.33	-0.01	0.329	3.917	3
3.851	0.447	0.33	-0.04	0.333	3.877	3
4.020	2.124	0.26	0.02	0.261	4.029	5
4.043	1.932	0.27	0.02	0.271	4.044	5
4.009	1.735	0.28	0.02	0.278	4.011	4
4.031	1.565	0.30	0.00	0.304	4.042	4
4.037	1.367	0.34	0.01	0.340	4.066	4
4.026	1.188	0.38	0.02	0.378	4.080	4
4.019	1.009	0.39	0.01	0.387	4.106	4
3.998	0.801	0.37	-0.00	0.370	4.078	3
4.000	0.653	0.36	-0.04	0.361	4.053	3
3.973	0.469	0.39	-0.08	0.399	4.005	3
3.961	0.278	0.35	-0.05	0.363	3.970	3
4.174	2.128	0.32	0.03	0.317	4.183	5
4.157	1.921	0.29	-0.00	0.289	4.158	5
4.170	1.717	0.32	0.00	0.315	4.172	4
4.154	1.509	0.34	0.00	0.344	4.168	4
4.135	1.335	0.36	0.00	0.363	4.168	4
4.156	1.156	0.39	0.00	0.391	4.214	4
4.140	0.975	0.46	0.04	0.460	4.232	4
4.130	0.799	0.44	-0.02	0.436	4.207	3
4.101	0.609	0.43	-0.04	0.429	4.146	3
4.100	0.399	0.42	-0.05	0.420	4.119	3
4.279	2.130	0.34	0.02	0.338	4.288	5
4.304	1.942	0.39	0.01	0.387	4.305	5
4.274	1.735	0.36	-0.01	0.357	4.276	4
4.279	1.552	0.41	-0.00	0.410	4.289	4
4.258	1.352	0.39	-0.02	0.387	4.288	4
4.259	1.177	0.40	-0.03	0.399	4.312	4
4.260	0.996	0.44	-0.03	0.444	4.345	4
4.254	0.809	0.48	-0.03	0.485	4.380	4
4.254	0.626	0.52	-0.03	0.524	4.300	3
4.239	0.461	0.49	-0.05	0.492	4.264	3
4.210	0.272	0.39	-0.03	0.393	4.218	3
4.401	2.106	0.45	0.06	0.460	4.408	5
4.405	1.910	0.43	0.00	0.432	4.405	5
4 417	1.735	0.56	0.00	0.561	4.418	4
4.393	1.533	0.44	-0.03	0.442	4.404	4
4.392	1.365	0.46	-0.04	0.464	4.419	4
4.393	1.185	0.45	-0.04	0.450	4.443	4
4.373	0.992	0.50	-0.03	0.500	4.457	4
4.353	0.818	0.39	-0.03	0.392	4.474	4
4.365	0.643	0.43	-0.07	0.432	4.412	3
4.346	0.431	0.55	-0.09	0.559	4.368	3

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
VELOCITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 7.7

VELOCITY FIELD   DIPOLE WEST/11   WF5/295   30°   SMOKE PUFF GRID 1220   /A730120

PARTICLE VELOCITIES AT SCALED TIME= 5.000 MS

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
3.165	2.236	0.11	0.08	0.133	3.195	5
3.197	2.046	0.12	0.02	0.123	3.203	5
3.203	1.842	0.14	-0.01	0.137	3.203	4
3.192	1.579	0.13	-0.04	0.131	3.204	4
3.065	1.409	0.05	0.03	0.056	3.097	4
3.080	1.239	0.10	0.03	0.101	3.120	4
3.078	1.047	0.18	0.04	0.184	3.082	1
3.130	0.863	0.15	0.06	0.157	3.130	1
3.254	0.686	0.12	0.11	0.164	3.061	1
3.064	0.339	0.08	0.03	0.086	3.086	1
3.249	0.288	0.08	-0.01	0.080	3.063	3
3.175	2.250	0.12	0.08	0.139	3.378	5
3.339	2.001	0.11	0.06	0.125	3.342	5
3.363	1.771	0.08	0.05	0.090	3.364	4
3.341	1.610	0.11	0.04	0.118	3.350	4
3.364	1.396	0.15	0.00	0.146	3.395	4
3.308	1.249	0.01	0.03	0.029	3.362	4
3.260	1.043	0.09	0.02	0.087	3.358	4
3.219	0.855	0.02	0.05	0.055	3.219	1
3.244	0.669	0.11	0.10	0.150	3.252	1
3.301	0.510	0.07	0.14	0.158	3.341	3
3.250	0.287	0.06	0.08	0.105	3.263	3
3.558	2.217	0.14	0.06	0.150	3.577	5
3.520	1.993	0.15	0.05	0.159	3.523	5
3.565	1.789	0.15	0.05	0.153	3.507	4
3.527	1.589	0.14	0.01	0.143	3.537	4
3.527	1.393	0.13	0.02	0.135	3.557	4
3.534	1.182	0.12	0.01	0.122	3.597	4
3.463	1.018	0.04	0.02	0.046	3.562	4
3.463	0.848	0.10	0.03	0.101	3.463	1
3.475	0.652	0.07	0.07	0.095	3.535	3
3.490	0.465	0.11	0.11	0.160	3.521	3
3.455	0.292	-0.06	0.01	0.058	3.469	3
3.639	2.205	0.14	0.05	0.152	3.706	5
3.675	1.973	0.17	0.06	0.183	3.677	5
3.686	1.789	0.17	0.05	0.177	3.686	4
3.702	1.599	0.15	0.04	0.168	3.711	4
3.685	1.383	0.15	0.02	0.151	3.715	4
3.673	1.150	0.13	0.01	0.134	3.759	4
3.603	1.011	0.08	0.02	0.085	3.700	4
3.609	0.816	0.11	0.03	0.114	3.754	4
3.629	0.642	0.11	0.05	0.118	3.686	3
3.636	0.452	0.13	0.07	0.148	3.664	3
3.676	0.280	0.18	0.06	0.188	3.687	3
3.821	2.173	0.16	0.05	0.170	3.834	5
3.848	1.987	0.15	0.05	0.155	3.850	5
3.813	1.782	0.17	0.05	0.181	3.813	4
3.819	1.572	0.17	0.05	0.180	3.830	4
3.802	1.369	0.15	0.02	0.155	3.833	4
3.830	1.172	0.16	0.01	0.157	3.890	4
3.825	0.969	0.13	-0.00	0.130	3.925	4
3.845	0.811	0.16	0.01	0.164	3.983	4
3.785	0.633	0.16	0.05	0.163	3.837	3
3.783	0.455	0.17	0.05	0.179	3.811	3
3.795	0.280	0.21	0.05	0.212	3.805	3
3.929	2.179	0.18	0.03	0.178	3.943	5
3.972	1.964	0.19	0.05	0.193	3.973	5
3.957	1.756	0.19	0.05	0.197	3.958	4
3.978	1.560	0.21	0.04	0.210	3.989	4
3.933	1.372	0.17	0.02	0.172	3.962	4
3.973	1.213	0.19	0.02	0.189	4.024	4
3.933	0.993	0.16	-0.00	0.159	4.025	4
3.939	0.509	0.17	-0.01	0.172	4.075	4
3.943	0.626	0.14	0.02	0.140	3.992	3
3.938	0.449	0.21	0.04	0.211	3.963	3

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
4.094	2.134	0.19	0.03	0.190	4.104	5
4.121	1.943	0.20	0.04	0.201	4.122	5
4.089	1.747	0.20	0.04	0.203	4.090	4
4.117	1.571	0.21	0.03	0.211	4.127	4
4.130	1.375	0.21	0.03	0.212	4.157	4
4.126	1.195	0.21	0.01	0.214	4.178	4
4.120	1.015	0.24	0.01	0.236	4.204	4
4.099	0.802	0.23	0.00	0.231	4.176	3
4.095	0.643	0.22	-0.01	0.218	4.145	3
4.092	0.449	0.27	-0.02	0.273	4.115	3
4.067	0.262	0.27	-0.03	0.267	4.076	3
4.259	2.137	0.20	0.03	0.205	4.269	5
4.238	1.924	0.21	0.02	0.207	4.239	5
4.259	1.723	0.22	0.03	0.225	4.261	4
4.252	1.516	0.24	0.03	0.242	4.265	4
4.240	1.338	0.25	0.01	0.247	4.271	4
4.253	1.160	0.25	0.01	0.262	4.324	4
4.260	0.982	0.25	-0.00	0.254	4.343	4
4.246	0.797	0.25	-0.01	0.255	4.320	3
4.213	0.599	0.27	-0.01	0.255	4.255	3
4.220	0.389	0.29	-0.01	0.293	4.238	3
4.368	2.133	0.21	0.01	0.215	4.377	5
4.401	1.942	0.22	0.01	0.221	4.402	5
4.374	1.739	0.25	0.02	0.248	4.375	4
4.389	1.554	0.26	0.01	0.260	4.399	4
4.369	1.355	0.27	0.02	0.267	4.397	4
4.378	1.178	0.29	0.02	0.294	4.430	4
4.380	0.997	0.27	0.01	0.272	4.463	4
4.380	0.806	0.27	-0.02	0.272	4.503	4
4.373	0.629	0.24	0.01	0.243	4.423	3
4.370	0.445	0.30	-0.03	0.304	4.393	3
4.332	0.275	0.33	0.03	0.331	4.341	3
4.507	2.112	0.22	0.00	0.223	4.514	5
4.511	1.910	0.23	0.01	0.235	4.511	5
4.550	1.736	0.28	0.01	0.276	4.551	4
4.512	1.532	0.28	0.02	0.283	4.523	4
4.520	1.362	0.30	0.01	0.302	4.547	4
4.528	1.182	0.34	0.01	0.340	4.578	4
4.512	0.938	0.33	-0.00	0.327	4.594	4
4.503	0.820	0.37	-0.02	0.373	4.620	4
4.507	0.639	0.34	-0.01	0.337	4.552	3
4.492	0.409	0.35	-0.04	0.355	4.511	3
4.506	0.265	0.40	0.05	0.403	4.514	3
4.672	2.129	0.30	0.00	0.304	4.681	5
4.663	1.916	0.29	-0.01	0.290	4.663	5
4.677	1.721	0.36	-0.01	0.363	4.679	4
4.652	1.526	0.32	-0.01	0.316	4.664	4
4.653	1.354	0.36	-0.00	0.358	4.679	4
4.652	1.179	0.35	-0.01	0.362	4.700	4
4.635	1.004	0.33	-0.02	0.333	4.712	4
4.628	0.813	0.34	-0.09	0.349	4.743	4
4.625	0.646	0.46	-0.08	0.466	4.671	3
4.629	0.434	0.42	-0.04	0.425	4.649	3
4.595	0.268	0.30	-0.04	0.298	4.603	3
4.764	2.116	0.36	0.02	0.358	4.792	5
4.765	1.941	0.35	0.00	0.348	4.766	5
4.789	1.719	0.35	-0.01	0.348	4.791	4
4.775	1.526	0.35	-0.11	0.367	4.786	4
4.749	1.349	0.36	-0.05	0.366	4.775	4
4.772	1.183	0.43	-0.00	0.427	4.818	4
4.764	1.004	0.42	0.01	0.422	4.839	4
4.765	0.808	0.47	-0.09	0.430	4.878	4
4.751	0.638	0.38	-0.11	0.397	4.794	3
4.737	0.435	0.42	-0.11	0.434	4.757	3

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
VELOCITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 7.8

VELOCITY FIELD   DIPOLE WEST/II WES/295 30'   SMOKE PUFF GRID 1220   /A730120

PARTICLE VELOCITIES AT SCALED TIME= 9.000 MS

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
3.404	2.275	0.39	0.06	0.104	3.430	5
3.367	2.013	0.38	0.01	0.081	3.371	5
3.395	1.780	0.20	-0.00	0.198	3.396	4
3.372	1.608	0.11	-0.08	0.130	3.381	4
3.426	1.38[illegible]	0.24	-0.08	0.252	3.458	4
3.347	1.204	0.35	0.08	0.362	3.393	4
3.313	1.065	0.26	0.12	0.288	3.405	4
3.219	0.874	-0.01	0.06	0.061	3.219	1
3.295	0.688	0.12	-0.05	0.133	3.292	1
3.337	0.526	0.18	-0.16	0.238	3.378	3
3.277	0.285	0.15	-0.20	0.250	3.289	3
3.593	2.236	0.06	0.05	0.081	3.613	5
3.559	2.007	0.07	0.03	0.078	3.562	5
3.501	1.797	0.06	-0.00	0.060	3.602	4
3.562	1.584	0.07	-0.03	0.077	3.572	4
3.535	1.393	0.04	-0.01	0.044	3.584	4
3.562	1.185	0.05	0.01	0.054	3.624	4
3.435	1.026	0.14	0.03	0.145	3.581	4
3.497	0.852	0.11	0.06	0.123	3.634	4
3.495	0.671	0.09	0.01	0.089	3.559	3
3.521	0.496	0.08	-0.01	0.082	3.550	3
3.732	2.225	0.11	0.06	0.121	3.750	5
3.721	1.994	0.09	0.03	0.100	3.724	5
3.725	1.795	0.06	-0.01	0.065	3.726	4
3.740	1.599	0.06	-0.03	0.068	3.748	4
3.720	1.381	0.05	-0.02	0.069	3.749	4
3.727	1.151	0.08	-0.00	0.078	3.792	4
3.514	1.021	0.13	0.04	0.138	3.727	4
3.649	0.839	0.13	0.10	0.170	3.787	4
3.657	0.665	0.10	0.08	0.130	3.726	3
3.671	0.477	0.10	0.04	0.104	3.702	3
3.720	0.300	0.10	0.03	0.101	3.732	3
3.370	2.190	0.12	0.05	0.132	3.884	5
3.868	2.000	0.09	0.02	0.097	3.891	5
3.860	1.792	0.10	0.00	0.099	3.860	4
3.863	1.577	0.09	-0.02	0.088	3.873	4
3.840	1.370	0.08	-0.01	0.080	3.870	4
3.871	1.175	0.09	0.01	0.095	3.930	4
3.859	0.973	0.10	0.05	0.107	3.957	4
3.899	0.823	0.12	0.07	0.140	4.032	4
3.838	0.657	0.15	0.08	0.169	3.894	3
3.834	0.476	0.16	0.04	0.167	3.863	3
3.851	0.295	0.14	0.03	0.147	3.862	3
3.983	2.195	0.14	0.00	0.152	3.998	5
4.028	1.981	0.14	0.04	0.149	4.030	5
4.012	1.769	0.13	0.03	0.135	4.013	4
4.035	1.572	0.13	0.02	0.132	4.045	4
3.979	1.378	0.11	0.01	0.106	4.007	4
4.023	1.220	0.12	0.02	0.120	4.072	4
3.980	0.996	0.12	0.02	0.119	4.071	4
3.992	0.811	0.15	0.05	0.156	4.125	4
3.986	0.632	0.16	0.03	0.160	4.035	3
4.003	0.457	0.17	0.05	0.175	4.030	3
4.151	2.148	0.15	0.05	0.155	4.162	5
4.181	1.960	0.15	0.05	0.161	4.182	5
4.146	1.760	0.14	0.03	0.145	4.147	4
4.176	1.583	0.14	0.03	0.140	4.184	4
4.185	1.382	0.13	0.02	0.127	4.212	4
4.179	1.196	0.11	0.00	0.115	4.230	4
4.192	1.013	0.17	0.00	0.172	4.275	4
4.162	0.807	0.14	0.04	0.146	4.291	4
4.159	0.654	0.17	0.07	0.181	4.210	3
4.154	0.461	0.11	0.10	0.150	4.133	3
4.141	0.270	0.17	0.09	0.187	4.150	3
4.320	2.149	0.16	0.04	0.165	4.330	5
4.302	1.937	0.17	0.04	0.176	4.303	5
4.326	1.734	0.17	0.03	0.173	4.327	4
4.319	1.524	0.16	0.02	0.159	4.332	4
4.306	1.344	0.14	0.02	0.140	4.335	4
4.337	1.163	0.15	0.01	0.151	4.391	4
4.329	0.982	0.17	0.01	0.167	4.416	4
4.315	0.790	0.17	0.00	0.172	4.387	3
4.298	0.609	0.22	0.05	0.228	4.341	3

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
4.299	0.395	0.17	0.04	0.176	4.317	3
4.435	2.143	0.19	0.04	0.191	4.445	5
4.469	1.951	0.18	0.04	0.188	4.470	5
4.448	1.749	0.19	0.03	0.193	4.449	4
4.464	1.561	0.19	0.02	0.192	4.474	4
4.443	1.360	0.17	0.01	0.175	4.470	4
4.453	1.183	0.18	0.01	0.181	4.508	4
4.464	0.994	0.25	-0.02	0.249	4.540	4
4.463	0.801	0.23	0.01	0.235	4.535	3
4.456	0.631	0.23	0.01	0.227	4.500	3
4.467	0.448	0.27	0.00	0.279	4.489	3
4.445	0.277	0.31	-0.01	0.313	4.453	3
4.575	2.117	0.19	0.04	0.191	4.582	5
4.582	1.917	0.19	0.03	0.197	4.582	5
4.629	1.743	0.20	0.03	0.207	4.630	4
4.593	1.541	0.20	0.03	0.204	4.604	4
4.605	1.365	0.20	0.01	0.203	4.630	4
4.623	1.184	0.22	0.00	0.218	4.671	4
4.602	0.989	0.21	0.00	0.209	4.682	4
4.590	0.808	0.18	-0.03	0.184	4.707	4
4.593	0.628	0.20	-0.03	0.203	4.636	3
4.602	0.402	0.29	0.02	0.295	4.620	3
4.613	0.278	0.23	0.03	0.230	4.621	3
4.755	2.133	0.21	0.03	0.208	4.763	5
4.745	1.919	0.21	0.03	0.212	4.745	5
4.773	1.724	0.23	0.03	0.229	4.775	4
4.745	1.531	0.23	0.03	0.234	4.756	4
4.755	1.361	0.25	0.02	0.248	4.780	4
4.756	1.179	0.26	0.00	0.255	4.803	4
4.753	0.992	0.25	-0.03	0.261	4.830	4
4.745	0.416	0.32	0.01	0.319	4.763	3
4.707	0.254	0.39	-0.01	0.391	4.714	3
4.878	2.121	0.22	0.02	0.222	4.885	5
4.857	1.943	0.22	0.02	0.221	4.858	5
4.888	1.717	0.25	0.01	0.247	4.890	4
4.873	1.522	0.27	0.03	0.271	4.864	4
4.853	1.348	0.27	0.02	0.272	4.884	4
4.893	1.184	0.31	-0.00	0.307	4.943	4
4.887	1.004	0.28	-0.01	0.284	4.960	4
4.892	0.793	0.27	-0.02	0.272	4.950	3
4.869	0.613	0.33	0.01	0.334	4.907	3
4.856	0.424	0.32	0.02	0.324	4.874	3
4.863	0.261	0.35	-0.02	0.347	4.870	3
5.032	2.098	0.26	0.03	0.280	5.038	5
5.020	1.912	0.27	0.01	0.266	5.021	5
5.034	1.729	0.29	0.02	0.290	5.035	4
5.036	1.552	0.30	0.02	0.303	5.045	4
5.023	1.353	0.34	0.02	0.337	5.047	4
5.031	1.179	0.34	0.01	0.342	5.076	4
5.020	0.994	0.35	-0.01	0.355	5.093	4
5.017	0.804	0.29	-0.07	0.296	5.031	3
5.005	0.529	0.31	-0.16	0.349	5.045	3
5.008	0.254	0.39	-0.08	0.396	5.015	3
5.171	2.087	0.32	-0.00	0.324	5.176	5
5.150	1.886	0.28	-0.02	0.285	5.151	5
5.165	1.717	0.32	-0.01	0.318	5.168	4
5.153	1.532	0.35	0.00	0.353	5.162	4
5.156	1.356	0.37	-0.02	0.371	5.179	4
5.161	1.155	0.35	-0.01	0.348	5.208	4
5.154	0.995	0.18	-0.10	0.211	5.225	4
5.158	0.825	0.76	0.09	0.763	5.259	4
5.131	0.632	0.37	0.26	0.311	5.170	3
5.121	0.449	0.39	-0.01	0.395	5.140	3
5.118	0.250	0.27	0.18	0.325	5.122	3
5.276	2.128	0.25	-0.02	0.254	5.243	5
5.284	1.896	0.32	0.00	0.320	5.285	5
5.291	1.716	0.31	-0.03	0.312	5.292	4
5.29	1.548	0.27	-0.02	0.273	5.302	4
5.285	1.360	0.26	-0.03	0.260	5.308	4
5.278	1.153	0.23	-0.07	0.243	5.324	4
5.275	0.989	0.11	0.92	0.925	5.345	4
5.287	0.831	-0.73	0.73	1.039	5.334	4
5.267	0.630	0.21	-0.02	0.212	5.304	3

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.9933 TIMES SCALED VALUE.
VELOCITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 7.9

VELOCITY FIELD   DIPOLE WEST/11   #F5/295   30°   SMOKE PUFF GRID 1220   /A730120

PARTICLE VELOCITIES AT SCALED TIME= 10.000 MS

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
3.605	2.246	0.03	-0.00	0.028	3.627	5
3.574	2.013	0.04	0.01	0.037	3.578	5
3.617	1.798	0.06	0.03	0.069	3.617	4
3.597	1.586	0.10	0.09	0.137	3.597	4
3.577	1.391	0.15	0.03	0.147	3.607	4
3.586	1.193	0.12	0.06	0.138	3.646	4
3.759	2.240	0.05	0.02	0.055	3.779	5
3.743	2.002	0.05	0.02	0.056	3.746	5
3.742	1.793	0.07	0.03	0.075	3.742	4
3.760	1.594	0.11	0.04	0.115	3.759	4
3.747	1.381	0.14	0.06	0.155	3.777	4
3.760	1.155	0.14	0.05	0.153	3.824	4
3.901	2.207	0.06	0.05	0.078	3.917	5
3.912	2.004	0.05	0.01	0.048	3.915	5
3.862	1.790	0.05	0.01	0.047	3.883	4
3.885	1.569	0.07	0.01	0.068	3.895	4
3.870	1.374	0.12	0.06	0.137	3.899	4
3.905	1.182	0.13	0.04	0.136	3.962	4
4.022	2.218	0.08	0.07	0.109	4.039	5
4.066	1.990	0.07	0.01	0.074	4.068	5
4.046	1.773	0.06	0.00	0.064	4.046	4
4.066	1.575	0.06	0.00	0.057	4.076	4
4.010	1.381	0.08	0.01	0.086	4.038	4
4.059	1.226	0.10	0.02	0.099	4.107	4
4.194	2.163	0.10	0.04	0.113	4.206	5
4.225	1.972	0.10	0.02	0.107	4.227	5
4.186	1.767	0.09	0.01	0.090	4.187	4
4.212	1.586	0.08	-0.00	0.079	4.220	4
4.221	1.387	0.09	0.01	0.092	4.246	4
4.214	1.202	0.10	0.03	0.106	4.264	4
4.370	2.164	0.13	0.04	0.137	4.331	5
4.351	1.949	0.11	0.02	0.112	4.352	5
4.373	1.743	0.10	0.02	0.106	4.374	4
4.362	1.529	0.10	0.01	0.099	4.374	4
4.345	1.350	0.10	0.02	0.098	4.374	4
4.379	1.168	0.11	0.03	0.109	4.432	4
4.493	2.160	0.14	0.05	0.152	4.503	5
4.525	1.965	0.14	0.04	0.145	4.526	5
4.503	1.759	0.13	0.02	0.131	4.504	4

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
4.519	1.568	0.13	0.02	0.129	4.528	4
4.491	1.364	0.11	0.01	0.115	4.518	4
4.507	1.155	0.12	0.02	0.118	4.556	4
4.635	2.134	0.16	0.05	0.171	4.644	5
4.642	1.930	0.16	0.04	0.160	4.643	5
4.691	1.755	0.16	0.03	0.159	4.692	4
4.651	1.548	0.14	0.02	0.140	4.661	4
4.662	1.369	0.13	0.02	0.136	4.687	4
4.681	1.187	0.13	0.02	0.135	4.728	4
4.820	2.148	0.18	0.05	0.134	4.829	5
4.810	1.932	0.17	0.04	0.177	4.811	5
4.841	1.735	0.17	0.03	0.175	4.842	4
4.811	1.538	0.15	0.02	0.159	4.821	4
4.823	1.365	0.16	0.01	0.160	4.848	4
4.828	1.181	0.17	0.02	0.173	4.874	4
4.946	2.132	0.18	0.05	0.189	4.954	5
4.925	1.955	0.18	0.04	0.186	4.926	5
4.961	1.727	0.18	0.04	0.188	4.963	4
4.954	1.530	0.18	0.02	0.181	4.964	4
4.933	1.353	0.17	0.02	0.174	4.958	4
4.981	1.183	0.19	-0.00	0.190	5.026	4
5.110	2.112	0.19	0.04	0.199	5.116	5
5.098	1.922	0.21	0.04	0.210	5.099	5
5.119	1.740	0.21	0.03	0.215	5.120	4
5.126	1.563	0.22	0.03	0.222	5.134	4
5.117	1.360	0.22	0.02	0.219	5.140	4
5.123	1.179	0.23	-0.00	0.227	5.171	4
5.256	2.093	0.21	0.03	0.217	5.262	5
5.236	1.891	0.23	0.04	0.230	5.237	5
5.259	1.723	0.24	0.03	0.240	5.261	4
5.252	1.534	0.24	0.01	0.241	5.262	4
5.262	1.358	0.25	0.02	0.254	5.285	4
5.266	1.154	0.25	-0.00	0.255	5.312	4
5.363	2.132	0.23	0.03	0.231	5.370	5
5.382	1.897	0.25	0.02	0.252	5.383	5
5.392	1.718	0.27	0.03	0.259	5.393	4
5.398	1.550	0.29	0.03	0.293	5.407	4
5.395	1.360	0.30	0.02	0.301	5.417	4
5.385	1.150	0.30	0.01	0.303	5.431	4

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
VELOCITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 7.10

VELOCITY FIELD DIPOLE WEST/11 #F5/295 30' SMOKE PUFF GRID 1220 /A780120

PARTICLE VELOCITIES AT SCALED TIME= 11.000 MS

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
4.036	2.233	-0.00	-0.01	0.009	4.054	5
4.077	1.996	-0.00	0.04	0.038	4.079	5
4.062	1.778	0.05	0.05	0.072	4.062	4
4.087	1.584	0.10	0.08	0.129	4.096	4
4.040	1.395	0.09	0.08	0.120	4.065	4
4.089	1.241	0.08	0.08	0.106	4.134	4
4.218	2.175	0.03	0.02	0.038	4.231	5
4.249	1.978	0.04	0.02	0.039	4.251	5
4.208	1.770	0.04	0.02	0.051	4.209	4
4.234	1.586	0.06	0.03	0.063	4.242	4
4.250	1.396	0.08	0.05	0.097	4.275	4
4.250	1.218	0.10	0.06	0.118	4.297	4
4.406	2.176	0.07	0.03	0.080	4.417	5
4.375	1.953	0.04	0.00	0.037	4.376	5
4.398	1.748	0.05	0.02	0.054	4.399	4
4.391	1.534	0.07	0.03	0.081	4.402	4
4.376	1.359	0.09	0.04	0.095	4.403	4
4.414	1.184	0.10	0.06	0.117	4.464	4
4.529	2.173	0.07	0.03	0.072	4.541	5
4.560	1.974	0.06	0.01	0.064	4.561	5
4.535	1.764	0.07	0.01	0.067	4.536	4
4.551	1.576	0.07	0.02	0.072	4.560	4
4.525	1.373	0.09	0.05	0.098	4.550	4
4.544	1.197	0.10	0.06	0.116	4.590	4
4.679	2.149	0.09	0.03	0.095	4.689	5
4.683	1.940	0.08	0.02	0.083	4.684	5
4.731	1.763	0.08	0.01	0.081	4.732	4
4.689	1.554	0.09	0.02	0.089	4.698	4
4.699	1.378	0.09	0.04	0.100	4.723	4
4.721	1.199	0.11	0.05	0.118	4.766	4

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
4.872	2.163	0.12	0.04	0.127	4.882	5
4.859	1.944	0.11	0.02	0.113	4.860	5
4.889	1.743	0.11	0.01	0.108	4.890	4
4.854	1.544	0.10	0.02	0.099	4.864	4
4.866	1.370	0.10	0.03	0.105	4.890	4
4.876	1.191	0.12	0.04	0.124	4.921	4
5.002	2.148	0.14	0.04	0.146	5.010	5
4.979	1.958	0.13	0.03	0.134	4.980	5
5.014	1.738	0.13	0.02	0.127	5.015	4
4.995	1.535	0.12	0.01	0.119	5.005	4
4.980	1.360	0.11	0.03	0.117	5.004	4
5.034	1.139	0.13	0.04	0.134	5.077	4
5.169	2.125	0.15	0.03	0.159	5.176	5
5.161	1.938	0.16	0.04	0.162	5.162	5
5.180	1.751	0.15	0.03	0.153	5.181	4
5.187	1.571	0.14	0.02	0.145	5.194	4
5.175	1.366	0.14	0.02	0.137	5.198	4
5.190	1.182	0.15	0.03	0.155	5.233	4
5.324	2.107	0.18	0.04	0.186	5.330	5
5.305	1.904	0.17	0.04	0.178	5.305	5
5.330	1.734	0.18	0.03	0.179	5.331	4
5.321	1.540	0.17	0.02	0.167	5.330	4
5.332	1.363	0.17	0.01	0.157	5.354	4
5.337	1.156	0.18	0.02	0.176	5.382	4
5.423	2.144	0.15	0.04	0.167	5.436	5
5.455	1.910	0.19	0.04	0.192	5.456	5
5.469	1.729	0.19	0.03	0.188	5.470	4
5.473	1.561	0.18	0.03	0.184	5.486	4
5.474	1.365	0.18	0.01	0.177	5.496	4
5.465	1.150	0.18	0.00	0.179	5.510	4

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
VELOCITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 7.11

VELOCITY FIELD   DIPOLE WEST/11   WFS/295   30°   SMOKE PUFF GRID 1220   /A780120

PARTICLE VELOCITIES AT SCALED TIME= 12.000 MS

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
4.415	2.182	-0.03	0.00	0.025	4.427	5
4.386	1.961	0.06	0.08	0.097	4.387	5
4.418	1.765	0.10	0.10	0.141	4.419	4
4.419	1.557	0.11	0.11	0.154	4.429	4
4.402	1.379	0.06	0.08	0.099	4.428	4
4.442	1.198	0.05	-0.00	0.045	4.490	4
4.543	2.180	0.03	0.03	0.037	4.554	5
4.573	1.981	0.04	0.04	0.059	4.575	5
4.553	1.775	0.05	0.07	0.088	4.553	4
4.573	1.598	0.08	0.06	0.101	4.581	4
4.553	1.394	0.08	0.07	0.108	4.576	4
4.577	1.219	0.09	0.05	0.103	4.621	4
4.599	2.156	0.04	0.02	0.045	4.709	5
4.701	1.946	0.04	0.02	0.049	4.702	5
4.751	1.769	0.06	0.04	0.074	4.752	4
4.717	1.567	0.10	0.06	0.116	4.725	4
4.730	1.395	0.10	0.06	0.114	4.752	4
4.757	1.219	0.11	0.05	0.120	4.799	4
4.901	2.171	0.06	0.02	0.060	4.912	5
4.886	1.945	0.06	0.01	0.057	4.887	5
4.917	1.746	0.07	0.02	0.078	4.918	4
4.883	1.555	0.09	0.05	0.101	4.892	4
4.897	1.387	0.09	0.06	0.111	4.919	4
4.911	1.209	0.10	0.05	0.109	4.953	4

X-SCAL METERS	Y-SCAL METERS	U=DX/DT MACH NO	V=DY/DT MACH NO	PARTICLE VELOCITY	R-SCAL METERS	REGN CODE
5.039	2.157	0.08	0.02	0.080	5.048	5
5.012	1.974	0.07	0.01	0.069	5.014	5
5.043	1.742	0.08	0.02	0.083	5.049	4
5.015	1.375	0.10	0.06	0.114	5.038	4
5.073	1.207	0.11	0.06	0.121	5.114	4
5.214	2.135	0.10	0.03	0.108	5.222	5
5.203	1.948	0.09	0.02	0.094	5.204	5
5.223	1.750	0.10	0.02	0.105	5.224	4
5.223	1.578	0.11	0.03	0.113	5.235	4
5.216	1.377	0.11	0.05	0.121	5.237	4
5.237	1.199	0.12	0.06	0.136	5.277	4
5.376	2.121	0.12	0.03	0.129	5.383	5
5.354	1.915	0.11	0.02	0.113	5.35[illegible]	5
5.378	1.743	0.11	0.02	0.112	5.379	4
5.367	1.547	0.12	0.02	0.118	5.376	4
5.381	1.370	0.13	0.04	0.137	5.403	4
5.391	1.167	0.15	0.05	0.154	5.435	4
5.482	2.156	0.15	0.03	0.155	5.490	5
5.512	1.920	0.14	0.02	0.145	5.513	5
5.521	1.739	0.13	0.02	0.126	5.522	4
5.530	1.567	0.13	0.01	0.133	5.537	4
5.529	1.372	0.16	0.03	0.158	5.550	4
5.524	1.159	0.18	0.05	0.186	5.566	4

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
VELOCITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 8.1

DENSITY FIELD   DIPOLE WEST/11   WF5/295   30°   SMOKE PUFF GRID 1220   /A780120

AVERAGE DENSITIES AT SCALED TIME= 1.000 MS

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
1.322	2.007	1.694	1.541	2	1.384	0.946	1.415	1.384	1	1.613	1.112	1.225	1.626	1
1.311	1.361	1.683	1.311	5	1.369	0.714	1.451	1.382	1	1.611	0.935	1.131	1.512	1
1.313	1.707	1.678	1.539	1	1.341	0.503	1.758	1.400	1	1.611	0.754	1.223	1.618	1
1.330	1.543	2.073	1.475	1	1.298	0.318	1.955	1.425	1	1.606	0.563	1.230	1.642	1
1.360	1.371	2.112	1.437	1	1.594	1.487	1.002	1.697	1	1.562	0.371	1.112	1.651	1
1.389	1.167	1.730	1.413	1	1.605	1.301	1.154	1.653	1					

AVERAGE DENSITIES AT SCALED TIME= 2.000 MS

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
1.613	1.974	1.645	1.618	5	1.839	1.346	1.780	1.891	1	1.976	0.555	1.757	2.008	1
1.603	1.554	1.707	1.603	4	1.839	1.140	1.426	1.854	1	1.954	0.360	1.624	2.028	1
1.612	1.732	1.552	1.617	4	1.826	0.942	1.096	1.826	1	1.939	0.185	2.042	2.068	1
1.647	.580	1.468	1.780	1	1.801	0.737	1.166	1.809	1	2.172	2.045	1.028	2.180	5
1.558	1.403	1.235	1.731	1	1.780	0.538	1.080	1.818	1	2.177	1.859	1.022	2.177	5
1.639	1.186	1.026	1.663	1	1.781	0.310	1.576	1.878	1	2.172	1.675	1.015	2.179	4
1.619	0.946	0.938	1.620	1	1.936	2.045	2.300	1.996	5	2.163	1.489	1.067	2.245	1
1.588	0.712	1.755	1.599	1	1.995	1.862	2.218	1.995	5	2.175	1.305	1.152	2.211	1
1.582	0.464	1.498	1.642	1	1.983	1.680	2.252	1.991	4	2.182	1.130	1.193	2.194	1
1.598	0.272	1.343	1.719	1	1.975	1.502	1.971	2.064	1	2.163	0.947	1.237	2.184	1
1.831	2.010	1.823	1.838	5	1.994	1.314	1.817	2.035	1	2.163	0.756	1.246	2.173	1
1.842	1.861	1.514	1.842	5	2.013	1.131	1.663	2.025	1	2.147	0.570	1.177	2.173	1
1.837	1.703	2.207	1.843	4	2.018	0.948	1.803	2.019	1	2.141	0.397	1.116	2.200	1
1.827	1.535	2.044	1.933	1	2.006	0.766	1.726	2.011	1	2.118	0.207	1.103	2.230	1

AVERAGE DENSITIES AT SCALED TIME= 3.000 MS

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
1.759	1.734	0.903	1.763	4	2.177	0.763	1.580	2.182	1	2.514	1.433	2.463	2.540	4
1.803	1.564	0.928	1.919	1	2.163	0.548	1.698	2.192	1	2.499	1.315	2.241	2.533	1
1.836	1.376	0.955	1.895	1	2.162	0.357	1.492	2.231	1	2.500	1.139	1.715	2.511	1
1.840	1.153	1.036	1.858	1	2.173	0.177	1.532	2.292	1	2.494	0.953	1.629	2.494	1
1.833	0.937	0.927	1.833	1	2.414	2.078	1.576	2.425	5	2.481	0.750	1.601	2.485	1
2.076	1.711	1.129	2.081	4	2.425	1.865	2.050	2.425	5	2.476	0.587	1.651	2.495	1
2.029	1.527	1.294	2.123	1	2.403	1.652	1.535	2.411	4	2.457	0.402	1.581	2.508	1
2.036	1.324	1.419	2.079	1	2.381	1.486	1.671	2.409	4	2.454	0.210	2.027	2.453	3
2.034	1.125	1.514	2.046	1	2.365	1.312	1.903	2.399	1	2.724	2.069	1.043	2.733	5
2.024	0.943	1.248	2.025	1	2.353	1.144	1.473	2.365	1	2.718	1.877	1.071	2.718	5
1.990	0.333	1.339	2.071	1	2.339	0.950	1.380	2.339	1	2.703	1.698	1.048	2.707	4
2.278	2.074	1.601	2.289	5	2.319	0.748	1.329	2.324	1	2.704	1.508	1.018	2.726	4
2.324	1.872	1.690	2.324	5	2.300	0.559	1.420	2.326	1	2.698	1.332	1.015	2.747	4
2.264	1.670	1.719	2.271	4	2.309	0.380	1.557	2.368	1	2.698	1.150	1.034	2.709	1
2.212	1.494	1.479	2.289	1	2.311	0.187	1.732	2.318	3	2.688	0.958	1.075	2.669	1
2.213	1.313	1.391	2.250	1	2.540	2.075	2.290	2.550	5	2.680	0.781	1.074	2.683	1
2.205	1.134	1.488	2.216	1	2.535	1.879	2.065	2.535	5	2.673	0.600	1.069	2.690	1
2.198	0.953	1.666	2.199	1	2.532	1.683	2.338	2.538	4	2.666	0.414	1.038	2.711	1

X AND Y LOCATE THE CENTER OF A PLANE QUADRILATERAL WHICH IS A CELL OF 4 NEIGHBOURING SMOKE PUFFS.
DENSITY IS AVERAGED OVER THE AREA OF THE CELL AND IS EXPRESSED AS A RATIO TO THE AMBIENT DENSITY.

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
DENSITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

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TABLE 8.2

DENSITY FIELD   DIPOLE WEST/11 WF5/295 30°   SMOKE PUFF GRID 1220   /A780120

AVERAGE DENSITIES AT SCALED TIME= 4.000 MS

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
1.352	1.777	1.106	1.853	4	2.500	0.740	1.415	2.505	1	3.039	2.060	1.639	3.045	5
1.592	1.616	0.907	2.021	1	2.467	0.560	1.476	2.491	1	3.037	1.852	1.577	3.037	4
1.938	1.417	0.765	2.004	1	2.471	0.385	1.576	2.525	1	3.035	1.672	1.680	3.040	4
1.950	1.182	0.558	1.970	1	2.779	2.096	1.406	2.790	5	3.013	1.492	1.575	3.034	4
2.188	1.734	0.916	2.191	4	2.774	1.880	1.206	2.774	5	3.008	1.309	1.616	3.056	4
2.130	1.553	1.062	2.227	1	2.774	1.663	1.353	2.780	4	2.985	1.126	1.577	2.995	1
2.169	1.334	1.127	2.211	1	2.682	1.122	1.518	2.691	1	2.962	0.951	1.332	2.962	1
2.193	1.123	1.166	2.204	1	2.666	0.936	1.743	2.666	1	2.950	0.767	1.245	2.953	1
2.112	0.319	1.151	2.191	1	2.548	0.754	1.695	2.653	1	2.955	0.591	1.373	2.972	1
2.419	2.085	1.461	2.430	5	2.641	0.578	1.526	2.661	1	2.951	0.401	1.436	2.978	3
2.501	1.376	1.338	2.501	5	2.633	0.398	1.220	2.682	1	3.178	2.037	1.215	3.183	5
2.366	1.298	1.149	2.398	1	2.916	2.093	1.787	2.926	5	3.179	1.855	1.223	3.179	4
2.380	1.112	1.334	2.389	1	2.917	1.875	1.914	2.917	5	3.175	1.669	1.202	3.180	4
2.392	0.937	1.675	2.392	1	2.906	1.681	2.030	2.911	4	3.161	1.487	1.154	3.182	4
2.372	0.759	1.593	2.376	1	2.886	1.478	2.015	2.910	4	3.152	1.293	1.145	3.202	4
2.327	0.543	1.461	2.355	1	2.862	1.301	1.675	2.914	4	3.139	1.119	1.113	3.223	4
2.312	0.361	1.179	2.375	1	2.833	1.133	1.635	2.847	1	3.132	0.945	1.109	3.132	1
2.608	2.102	0.952	2.620	5	2.811	0.950	1.838	2.812	1	3.127	0.768	1.087	3.130	1
2.622	1.870	1.292	2.622	5	2.793	0.771	1.673	2.795	1	3.128	0.577	1.090	3.145	1
2.538	1.128	1.170	2.548	1	2.796	0.592	1.716	2.814	1	3.121	0.390	1.065	3.145	3
2.523	0.932	1.573	2.523	1	2.806	0.406	1.690	2.850	1	3.117	0.200	1.072	3.123	3

AVERAGE DENSITIES AT SCALED TIME= 5.000 MS

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
2.488	2.078	1.294	2.499	5	3.015	1.287	1.159	3.067	4	3.258	0.755	1.543	3.261	1
2.598	1.882	1.119	2.598	5	2.998	1.120	1.397	3.006	1	3.261	0.576	1.641	3.311	3
2.442	1.326	1.008	2.478	1	2.986	0.938	1.730	2.986	1	3.256	0.384	1.532	3.279	3
2.469	1.131	0.978	2.480	1	2.969	0.748	1.841	2.973	1	3.470	2.049	1.602	3.476	5
2.492	0.939	1.154	2.492	1	2.968	0.579	1.536	2.986	1	3.465	1.861	1.593	3.468	5
2.472	0.743	1.090	2.477	1	2.966	0.401	1.398	2.993	3	3.461	1.668	1.983	3.466	4
2.698	2.111	0.775	2.711	5	3.226	2.077	1.160	3.234	5	3.448	1.470	1.887	3.469	4
2.729	1.866	1.266	2.729	5	3.221	1.849	1.109	3.221	4	3.433	1.273	1.724	3.481	4
2.655	0.930	1.119	2.655	1	3.217	1.660	1.360	3.222	4	3.415	1.087	1.640	3.500	4
2.628	0.728	1.030	2.634	1	3.194	1.473	1.450	3.217	4	3.392	0.923	1.511	3.517	4
2.579	0.527	1.032	2.607	1	3.192	1.279	1.457	3.243	4	3.336	0.754	1.606	3.389	1
2.578	0.360	1.313	2.635	1	3.159	1.108	1.506	3.246	4	3.374	0.573	1.680	3.422	3
2.899	2.106	1.124	2.910	5	3.124	0.931	1.378	3.124	1	3.374	0.386	1.666	3.396	3
2.890	1.883	0.962	2.890	5	3.114	0.755	1.331	3.117	1	3.574	2.043	1.940	3.579	5
2.899	1.658	1.132	2.906	4	3.127	0.582	1.464	3.143	1	3.571	1.848	1.677	3.571	4
2.831	0.925	1.238	2.831	1	3.117	0.395	1.387	3.142	3	3.556	1.657	1.635	3.562	4
2.811	0.736	1.273	2.816	1	3.357	2.054	1.545	3.363	5	3.547	1.467	1.534	3.568	4
2.785	0.561	1.192	2.806	1	3.357	1.862	1.494	3.357	5	3.544	1.291	1.411	3.588	4
2.774	0.380	1.086	2.799	3	3.352	1.659	1.300	3.357	4	3.542	1.116	1.446	3.618	4
3.068	2.106	1.200	3.078	5	3.332	1.476	1.205	3.353	4	3.530	0.925	1.282	3.649	4
3.068	1.872	1.245	3.068	5	3.320	1.271	1.337	3.371	4	3.519	0.747	1.223	3.598	3
3.055	1.669	1.392	3.061	4	3.290	1.092	1.492	3.377	4	3.509	0.567	1.177	3.555	3
3.043	1.459	1.288	3.068	4	3.263	0.926	1.637	3.263	1	3.506	0.385	1.209	3.527	3

X AND Y LOCATE THE CENTER OF A PLANE QUADRILATERAL WHICH IS A CELL OF 4 NEIGHBOURING SMOKE PUFFS.
DENSITY IS AVERAGED OVER THE AREA OF THE CELL AND IS EXPRESSED AS A RATIO TO THE AMBIENT DENSITY.

OBSERVED DISTANCE VALUES= 4.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = [illegible] TIMES SCALED VALUE.
DENSITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 8.3

DENSITY FIELD   DIPOLE WEST/11   WF5/295   30°   SMOKE PUFF GRID 1220   /A780120

AVERAGE DENSITIES AT SCALED TIME= 6.000 MS

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
2.971	2.113	1.051	2.983	5	3.468	1.653	1.118	3.473	4	3.850	1.842	1.482	3.850	4
2.966	1.890	0.865	2.966	5	3.454	1.467	1.052	3.475	4	3.841	1.647	1.640	3.845	4
2.932	1.569	1.022	2.988	4	3.432	1.261	1.087	3.502	4	3.832	1.457	1.360	3.853	4
2.911	0.927	0.934	2.911	1	3.430	1.083	1.299	3.515	4	3.822	1.288	1.283	3.863	4
2.892	0.729	1.033	2.898	1	3.406	0.917	1.447	3.532	4	3.803	1.101	1.485	3.876	4
2.868	0.541	1.021	2.891	1	3.407	0.738	1.243	3.411	1	3.790	0.913	1.519	3.904	4
2.866	0.353	1.043	2.888	3	3.408	0.559	1.322	3.454	3	3.781	0.734	1.639	3.852	3
3.148	2.113	1.101	3.159	5	3.398	0.368	1.403	3.418	3	3.773	0.567	1.624	3.816	3
3.153	1.876	1.222	3.153	5	3.608	2.036	1.207	3.614	5	3.760	0.362	1.381	3.779	3
3.147	1.676	1.377	3.152	4	3.602	1.862	1.128	3.602	5	3.970	2.025	1.628	3.973	5
3.140	1.467	1.184	3.163	4	3.592	1.660	1.550	3.597	4	3.965	1.820	1.542	3.965	4
3.114	1.302	1.010	3.162	4	3.583	1.459	1.585	3.604	4	3.961	1.639	1.589	3.967	4
3.096	1.128	1.129	3.180	4	3.578	1.255	1.500	3.627	4	3.954	1.451	1.601	3.974	4
3.080	0.938	1.348	3.089	1	3.572	1.065	1.360	3.657	4	3.945	1.265	1.613	3.969	4
3.074	0.736	1.453	3.079	1	3.553	0.905	1.228	3.677	4	3.931	1.095	1.552	4.003	4
3.073	0.562	1.136	3.092	1	3.550	0.741	1.370	3.627	3	3.911	0.909	1.524	4.023	4
3.072	0.379	1.158	3.095	3	3.531	0.554	1.626	3.574	3	3.903	0.731	1.525	3.970	3
3.319	2.084	0.932	3.328	5	3.524	0.374	1.588	3.544	3	3.893	0.546	1.460	3.931	3
3.316	1.851	0.956	3.316	4	3.734	2.056	1.448	3.740	5	3.891	0.362	1.475	3.907	3
3.317	1.659	1.148	3.323	4	3.731	1.850	1.223	3.731	4	4.100	2.020	1.181	4.104	5
3.302	1.475	1.312	3.324	4	3.715	1.646	1.111	3.721	4	4.101	1.831	1.163	4.101	4
3.309	1.277	1.305	3.359	4	3.701	1.457	1.138	3.722	4	4.094	1.635	1.185	4.099	4
3.280	1.106	1.233	3.363	4	3.693	1.271	1.260	3.738	4	4.084	1.445	1.157	4.105	4
3.250	0.924	1.077	3.250	1	3.695	1.094	1.669	3.772	4	4.085	1.271	1.076	4.126	4
3.242	0.744	1.112	3.246	1	3.686	0.903	1.909	3.807	4	4.077	1.092	1.037	4.147	4
3.257	0.564	1.205	3.306	3	3.672	0.725	1.598	3.743	3	4.062	0.914	1.014	4.169	4
3.243	0.375	1.254	3.264	3	3.650	0.554	1.521	3.691	3	4.052	0.355	1.020	4.068	3
3.473	2.066	1.156	3.430	5	3.636	0.381	1.683	3.656	3					
3.467	1.861	1.232	3.467	5	3.848	2.043	1.462	3.853	5					

X AND Y LOCATE THE CENTER OF A PLANE QUADRILATERAL WHICH IS A CELL OF 4 NEIGHBOURING SMOKE PUFFS.
DENSITY IS AVERAGED OVER THE AREA OF THE CELL AND IS EXPRESSED AS A RATIO TO THE AMBIENT DENSITY.

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 3.5933 TIMES SCALED VALUE.
DENSITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 8.4

DENSITY FIELD   DIPOLE WEST/11 #F5/295 30°   SMOKE PUFF GRID 1220   /A780120

AVERAGE DENSITIES AT SCALED TIME= 7.000 MS

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
3.036	2.131	1.042	3.049	5	3.505	0.543	1.184	3.548	3	4.086	1.083	1.612	4.157	4
3.037	1.911	0.955	3.036	5	3.505	0.355	1.261	3.523	3	4.070	0.895	1.424	4.151	4
3.054	1.687	1.002	3.058	4	3.693	2.064	1.097	3.700	5	4.060	0.718	1.495	4.123	3
2.953	0.935	0.936	2.953	1	3.690	1.371	1.028	3.690	5	4.045	0.529	1.299	4.079	3
2.938	0.738	0.952	2.942	1	3.695	1.668	1.406	3.689	4	4.228	2.024	1.391	4.232	5
2.912	0.553	1.072	2.933	1	3.681	1.466	1.385	3.701	4	4.226	1.834	1.340	4.226	4
2.916	0.372	0.983	2.940	3	3.633	1.258	1.320	3.730	4	4.218	1.625	1.453	4.224	4
3.216	2.129	1.060	3.228	5	3.630	1.064	1.150	3.763	4	4.208	1.437	1.376	4.228	4
3.225	1.893	1.180	3.225	5	3.662	0.899	0.983	3.784	4	4.202	1.257	1.345	4.244	4
3.221	1.693	1.263	3.224	4	3.562	0.729	1.047	3.734	3	4.204	1.074	1.514	4.275	4
3.202	1.482	1.039	3.224	4	3.644	0.540	1.330	3.684	3	4.197	0.894	1.378	4.305	4
3.171	1.313	0.923	3.215	4	3.644	0.361	1.436	3.662	3	4.184	0.708	1.436	4.244	3
3.149	1.142	0.993	3.227	4	3.828	2.063	1.271	3.834	5	4.170	0.524	1.373	4.203	3
3.140	0.949	1.155	3.140	1	3.828	1.854	1.123	3.828	4	4.348	2.025	1.575	4.351	5
3.128	0.739	1.311	3.132	1	3.816	1.650	1.016	3.822	4	4.348	1.825	1.592	4.348	4
3.131	0.565	1.035	3.182	3	3.808	1.459	1.021	3.828	4	4.342	1.642	1.637	4.347	4
3.133	0.379	0.923	3.156	3	3.808	1.272	1.101	3.851	4	4.329	1.448	1.613	4.347	4
3.391	2.097	0.959	3.400	5	3.817	1.089	1.376	3.893	4	4.326	1.270	1.469	4.365	4
3.391	1.367	0.941	3.391	5	3.816	0.899	1.520	3.933	4	4.322	1.090	1.591	4.389	4
3.397	1.673	1.071	3.401	4	3.807	0.709	1.295	3.872	3	4.310	0.906	1.653	4.412	4
3.382	1.487	1.138	3.402	4	3.785	0.537	1.214	3.823	3	4.306	0.722	1.762	4.366	3
3.390	1.290	1.065	3.436	4	3.955	2.047	1.228	3.960	5	4.303	0.540	1.703	4.337	3
3.355	1.116	1.003	3.434	4	3.959	1.843	1.260	3.959	4	4.288	0.348	1.575	4.302	3
3.319	0.931	0.687	3.319	1	3.954	1.646	1.353	3.959	4	4.490	2.016	1.159	4.493	5
3.315	0.741	0.906	3.319	1	3.957	1.456	1.123	3.976	4	4.493	1.823	1.162	4.494	4
3.338	0.555	0.974	3.394	3	3.954	1.285	1.049	3.994	4	4.486	1.632	1.137	4.491	4
3.329	0.364	1.119	3.349	3	3.946	1.097	1.144	4.018	4	4.475	1.453	1.127	4.493	4
3.550	2.078	1.060	3.558	5	3.937	0.906	1.191	4.049	4	4.473	1.277	1.155	4.510	4
3.546	1.873	1.159	3.546	5	3.930	0.722	1.324	3.995	3	4.465	1.091	1.187	4.530	4
3.553	1.667	1.045	3.558	4	3.924	0.549	1.435	3.963	3	4.450	0.906	1.141	4.549	4
3.545	1.478	0.983	3.565	4	4.099	2.031	1.215	4.103	5	4.441	0.736	1.129	4.501	3
3.546	1.267	0.971	3.596	4	4.095	1.821	1.191	4.095	4	4.443	0.543	1.098	4.476	3
3.524	1.037	1.157	3.606	4	4.094	1.635	1.322	4.100	4	4.439	0.350	1.022	4.453	3
3.495	0.916	1.240	3.618	4	4.089	1.448	1.531	4.109	4					
3.499	0.731	1.093	3.574	3	4.088	1.258	1.620	4.131	4					

X AND Y LOCATE THE CENTER OF A PLANE QUADRILATERAL WHICH IS A CELL OF 4 NEIGHBOURING SMOKE PUFFS.
DENSITY IS AVERAGED OVER THE AREA OF THE CELL AND IS EXPRESSED AS A RATIO TO THE AMBIENT DENSITY.

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
DENSITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

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TABLE 8.5

DENSITY FIELD   DIPOLE WEST/11 WF5/295 30°   SMOKE PUFF GRID 1220   /A780120

AVERAGE DENSITIES AT SCALED TIME= 8.000 MS

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
3.271	2.153	1.044	3.284	5	3.707	0.547	1.189	3.747	3	4.447	2.028	1.432	4.451	5
3.277	1.912	1.169	3.277	5	3.722	0.371	1.270	3.741	3	4.457	1.824	1.351	4.457	4
3.259	1.703	1.190	3.272	4	3.894	2.074	1.198	3.900	5	4.458	1.646	1.358	4.463	4
3.242	1.487	0.972	3.263	4	3.897	1.870	1.053	3.897	5	4.445	1.448	1.415	4.464	4
3.197	1.326	0.876	3.239	4	3.891	1.666	0.970	3.895	4	4.449	1.269	1.261	4.487	4
3.178	1.151	1.068	3.254	4	3.883	1.472	0.921	3.901	4	4.451	1.088	1.342	4.516	4
3.172	0.964	1.375	3.173	1	3.883	1.279	1.002	3.925	4	4.443	0.904	1.341	4.542	4
3.160	0.757	1.482	3.164	1	3.891	1.092	1.217	3.965	4	4.442	0.723	1.422	4.501	3
3.167	0.598	1.122	3.182	1	3.886	0.898	1.474	4.002	4	4.439	0.531	1.310	4.471	3
3.165	0.410	0.807	3.191	3	3.877	0.712	1.196	3.942	3	4.422	0.345	1.568	4.435	3
3.447	2.116	0.915	3.457	5	3.862	0.542	1.126	3.900	3	4.539	2.015	1.199	4.592	5
3.446	1.886	0.867	3.446	5	4.027	2.057	1.175	4.033	5	4.601	1.824	1.321	4.601	4
3.453	1.691	0.961	3.457	4	4.034	1.855	1.186	4.034	4	4.597	1.627	1.303	4.603	4
3.439	1.499	1.020	3.457	4	4.034	1.657	1.261	4.039	4	4.584	1.444	1.319	4.602	4
3.437	1.299	0.869	3.481	4	4.040	1.464	1.013	4.058	4	4.538	1.270	1.452	4.625	4
3.389	1.127	0.878	3.466	4	4.042	1.292	0.921	4.080	4	4.531	1.089	1.597	4.644	4
3.348	0.940	0.847	3.348	1	4.035	1.101	0.948	4.104	4	4.571	0.906	1.563	4.668	4
3.351	0.757	0.881	3.354	1	4.025	0.907	0.974	4.134	4	4.555	0.730	1.409	4.623	3
3.380	0.577	0.961	3.429	3	4.017	0.721	1.092	4.081	3	4.563	0.530	1.417	4.593	3
3.370	0.389	0.965	3.393	3	4.018	0.542	1.129	4.054	3	4.557	0.350	1.769	4.570	3
3.610	2.095	1.032	3.619	5	4.180	2.040	1.120	4.184	5	4.720	2.027	1.354	4.723	5
3.511	1.891	1.076	3.611	5	4.176	1.828	1.126	4.176	4	4.725	1.823	1.429	4.725	4
3.620	1.685	0.947	3.623	4	4.182	1.642	1.200	4.187	4	4.723	1.621	1.272	4.729	4
3.612	1.492	0.913	3.630	4	4.184	1.453	1.357	4.203	4	4.708	1.442	1.440	4.725	4
3.611	1.277	0.901	3.657	4	4.190	1.263	1.452	4.232	4	4.705	1.263	1.495	4.743	4
3.573	1.093	1.055	3.653	4	4.193	1.088	1.421	4.262	4	4.706	1.091	1.430	4.767	4
3.536	0.923	1.137	3.656	4	4.179	0.899	1.186	4.287	4	4.698	0.906	1.359	4.792	4
3.542	0.739	1.066	3.619	3	4.166	0.712	1.208	4.226	3	4.693	0.728	1.283	4.749	3
3.558	0.554	1.173	3.601	3	4.156	0.518	1.158	4.188	3	4.635	0.541	1.461	4.717	3
3.564	0.366	1.041	3.583	3	4.316	2.027	1.235	4.319	5	4.669	0.345	1.658	4.681	3
3.756	2.081	1.098	3.763	5	4.318	1.838	1.197	4.318	4	4.846	2.016	1.317	4.843	5
3.757	1.889	1.039	3.757	5	4.317	1.630	1.283	4.323	4	4.844	1.829	1.322	4.844	4
3.756	1.587	1.368	3.760	4	4.314	1.442	1.236	4.333	4	4.855	1.632	1.245	4.860	4
3.752	1.481	1.268	3.770	4	4.313	1.250	1.227	4.354	4	4.843	1.449	1.363	4.860	4
3.751	1.265	1.223	3.797	4	4.322	1.078	1.426	4.390	4	4.832	1.270	1.363	4.867	4
3.741	1.067	1.003	3.822	4	4.317	0.894	1.233	4.422	4	4.839	1.091	1.322	4.893	4
3.716	0.901	0.877	3.836	4	4.303	0.704	1.293	4.360	3	4.836	0.906	1.241	4.927	4
3.718	0.731	0.950	3.790	3	4.293	0.516	1.169	4.324	3	4.831	0.721	1.317	4.885	3

X AND Y LOCATE THE CENTER OF A PLANE QUADRILATERAL WHICH IS A CELL OF 4 NEIGHBOURING SMOKE PUFFS.
DENSITY IS AVERAGED OVER THE AREA OF THE CELL AND IS EXPRESSED AS A RATIO TO THE AMBIENT DENSITY.

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
DENSITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 8.6

DENSITY FIELD   DIPOLE WEST/11   #F5/295   30°   SMOKE PUFF GRID 1220   /A780120

AVERAGE DENSITIES AT SCALED TIME=   9.000 MS

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
3.479	2.133	0.839	3.490	5	4.092	1.870	1.134	4.092	5	4.534	1.634	1.162	4.559	4
3.479	1.897	0.812	3.479	5	4.092	1.670	1.220	4.096	4	4.674	1.450	1.159	4.591	4
3.486	1.693	0.852	3.490	4	4.094	1.472	0.946	4.111	4	4.655	1.274	1.258	4.720	4
3.476	1.499	1.095	3.494	4	4.094	1.298	0.865	4.131	4	4.633	1.084	1.302	4.745	4
3.477	1.297	1.042	3.521	4	4.090	1.101	0.851	4.153	4	4.670	0.342	1.759	4.682	3
3.426	1.139	0.963	3.499	4	4.083	0.910	0.886	4.190	4	4.807	2.031	1.193	4.810	5
3.373	0.951	0.840	3.491	4	4.072	0.726	1.010	4.136	3	4.817	1.826	1.311	4.817	4
3.374	0.779	0.869	3.373	1	4.079	0.555	1.071	4.116	3	4.820	1.622	1.196	4.825	4
3.410	0.598	1.034	3.462	3	4.240	2.054	1.080	4.245	5	4.808	1.443	1.352	4.825	4
3.651	2.113	0.950	3.660	5	4.238	1.841	1.050	4.238	4	4.816	1.263	1.274	4.852	4
3.651	1.903	0.971	3.651	5	4.245	1.653	1.101	4.249	4	4.823	1.090	1.214	4.833	4
3.655	1.688	0.875	3.660	4	4.246	1.461	1.215	4.264	4	4.793	0.334	1.495	4.804	3
3.646	1.491	0.885	3.664	4	4.251	1.267	1.271	4.291	4	4.947	2.017	1.119	4.950	5
3.642	1.277	0.867	3.687	4	4.259	1.091	1.323	4.327	4	4.947	1.827	1.152	4.947	4
3.601	1.098	1.046	3.679	4	4.248	0.897	1.139	4.354	4	4.957	1.628	1.147	4.962	4
3.567	0.937	1.137	3.683	4	4.236	0.716	1.161	4.296	3	4.949	1.443	1.307	4.966	4
3.575	0.758	0.990	3.655	3	4.230	0.529	0.985	4.263	3	4.953	1.269	1.282	4.987	4
3.589	0.580	1.123	3.636	3	4.381	2.039	1.169	4.385	5	4.959	1.090	1.362	5.017	4
3.800	2.099	1.060	3.808	5	4.385	1.848	1.135	4.386	4	4.953	0.900	1.305	5.044	4
3.799	1.899	0.991	3.800	5	4.388	1.539	1.166	4.394	4	4.946	0.708	1.390	4.995	3
3.793	1.692	1.247	3.801	4	4.384	1.448	1.128	4.403	4	5.094	1.997	1.295	5.096	5
3.790	1.482	1.138	3.808	4	4.385	1.264	1.099	4.425	4	5.092	1.811	1.393	5.092	4
3.788	1.265	1.176	3.833	4	4.398	1.079	1.223	4.465	4	5.098	1.634	1.342	5.102	4
3.776	1.072	0.990	3.856	4	4.393	0.890	1.063	4.497	4	5.090	1.445	1.355	5.106	4
3.756	0.913	0.904	3.871	4	4.382	0.707	1.324	4.439	3	5.094	1.261	1.463	5.128	4
3.763	0.751	0.900	3.838	3	4.378	0.519	1.097	4.409	3	5.090	1.081	1.438	5.143	4
3.752	0.570	1.048	3.795	3	4.516	2.035	1.397	4.519	5	5.086	0.904	1.335	5.173	4
3.768	0.391	1.125	3.789	3	4.530	1.833	1.306	4.530	4	5.079	0.724	1.388	5.130	3
3.944	2.088	1.076	3.951	5	4.535	1.654	1.279	4.539	4	5.222	1.995	1.380	5.224	5
3.947	1.884	0.948	3.947	5	4.525	1.453	1.291	4.542	4	5.223	1.805	1.327	5.224	4
3.942	1.675	0.873	3.945	4	4.533	1.273	1.137	4.569	4	5.225	1.626	1.401	5.230	4
3.929	1.478	0.831	3.947	4	4.537	1.090	1.202	4.601	4	5.223	1.450	1.335	5.233	4
3.926	1.283	0.931	3.967	4	4.529	0.899	1.220	4.628	4	5.220	1.258	1.402	5.254	4
3.934	1.095	1.097	4.006	4	4.526	0.716	1.366	4.582	3	5.217	1.072	1.347	5.275	4
3.933	0.905	1.399	4.046	4	4.532	0.527	1.212	4.563	3	5.218	0.909	1.395	5.302	4
3.928	0.724	1.256	3.994	3	4.527	0.349	1.595	4.541	3	5.211	0.728	1.416	5.262	3
3.914	0.556	1.120	3.953	3	4.665	2.023	1.088	4.668	5	5.191	0.540	1.391	5.219	3
4.084	2.072	1.152	4.090	5	4.683	1.828	1.193	4.683	4	5.181	0.350	1.380	5.193	3

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DENSITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 8.7

DENSITY FIELD   DIPOLE WEST/11   WF5/295   30'   SMOKE PUFF GRID 1220   /A780120

AVERAGE DENSITIES AT SCALED TIME= 10.000 MS

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
3.670	2.123	0.861	3.680	5	4.286	2.068	1.018	4.292	5	4.873	2.043	1.150	4.877	5
3.668	1.906	0.913	3.668	5	4.283	1.851	0.975	4.283	4	4.886	1.837	1.239	4.886	4
3.675	1.687	0.874	3.679	4	4.286	1.659	1.019	4.291	4	4.892	1.630	1.075	4.897	4
3.669	1.488	0.879	3.687	4	4.284	1.466	1.162	4.302	4	4.881	1.450	1.199	4.897	4
3.669	1.280	0.859	3.714	4	4.289	1.272	1.212	4.328	4	4.891	1.265	1.147	4.926	4
3.826	2.110	0.978	3.835	5	4.434	2.054	1.082	4.438	5	5.020	2.029	1.027	5.024	5
3.820	1.900	0.926	3.821	5	4.437	1.859	1.045	4.438	5	5.023	1.837	1.058	5.023	4
3.818	1.689	1.175	3.822	4	4.438	1.646	1.062	4.443	4	5.039	1.638	1.049	5.043	4
3.815	1.480	1.213	3.833	4	4.431	1.454	1.037	4.449	4	5.034	1.450	1.167	5.050	4
3.819	1.269	1.166	3.853	4	4.430	1.269	1.023	4.468	4	5.040	1.272	1.089	5.073	4
3.977	2.101	0.912	3.985	5	4.574	2.050	1.317	4.579	5	5.176	2.005	1.183	5.178	5
3.977	1.888	0.852	3.977	5	4.588	1.845	1.221	4.588	4	5.177	1.819	1.312	5.177	4
3.968	1.675	0.801	3.972	4	4.592	1.663	1.202	4.596	4	5.190	1.641	1.219	5.194	4
3.958	1.479	0.830	3.976	4	4.579	1.459	1.198	4.596	4	5.187	1.452	1.220	5.203	4
3.959	1.288	0.927	3.999	4	4.586	1.276	1.060	4.622	4	5.194	1.264	1.298	5.228	4
4.124	2.087	1.053	4.131	5	4.728	2.038	1.036	4.731	5	5.311	1.998	1.264	5.313	5
4.130	1.878	1.047	4.130	5	4.747	1.840	1.129	4.747	4	5.318	1.809	1.216	5.318	4
4.126	1.674	1.146	4.130	4	4.748	1.644	1.073	4.752	4	5.324	1.629	1.295	5.329	4
4.127	1.476	0.917	4.144	4	4.736	1.455	1.049	4.753	4	5.328	1.452	1.263	5.343	4
4.128	1.303	0.858	4.164	4	4.749	1.277	1.132	4.783	4	5.327	1.257	1.317	5.360	4

AVERAGE DENSITIES AT SCALED TIME= 11.000 MS

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
4.142	2.096	0.944	4.150	5	4.613	2.062	1.205	4.618	5	5.078	2.043	0.981	5.081	5
4.149	1.883	0.972	4.149	5	4.625	1.853	1.139	4.625	4	5.080	1.850	0.974	5.080	4
4.147	1.679	1.121	4.150	4	4.629	1.670	1.150	4.632	4	5.092	1.645	0.940	5.096	4
4.152	1.485	0.937	4.168	4	4.614	1.467	1.170	4.630	4	5.087	1.458	1.056	5.102	4
4.159	1.317	0.861	4.193	4	4.622	1.287	1.043	4.657	4	5.095	1.277	1.002	5.127	4
4.314	2.077	0.936	4.320	5	4.774	2.051	0.961	4.778	5	5.241	2.019	1.119	5.244	5
4.306	1.855	0.957	4.306	4	4.792	1.849	1.045	4.792	4	5.243	1.831	1.203	5.243	4
4.310	1.662	0.980	4.314	4	4.790	1.650	1.011	4.794	4	5.255	1.650	1.109	5.259	4
4.312	1.473	1.173	4.329	4	4.777	1.461	1.016	4.793	4	5.252	1.458	1.116	5.266	4
4.322	1.286	1.257	4.359	4	4.791	1.286	1.097	4.824	4	5.260	1.267	1.183	5.292	4
4.466	2.062	1.005	4.471	5	4.926	2.057	1.081	4.930	5	5.380	2.010	1.232	5.383	5
4.467	1.865	0.974	4.467	5	4.937	1.848	1.156	4.937	4	5.390	1.821	1.143	5.391	4
4.468	1.653	1.019	4.472	4	4.938	1.638	1.032	4.942	4	5.398	1.639	1.182	5.402	4
4.462	1.462	1.021	4.479	4	4.924	1.455	1.181	4.940	4	5.402	1.459	1.134	5.417	4
4.464	1.280	1.023	4.500	4	4.939	1.273	1.115	4.973	4	5.402	1.260	1.191	5.435	4

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DENSITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 8.8

DENSITY FIELD   DIPOLE WEST/11   WF5/295   30°   SMOKE PUFF GRID 1220   /A730120

AVERAGE DENSITIES AT SCALED TIME= 12.000 MS

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
4.478	2.069	0.991	4.484	5
4.483	1.376	1.001	4.483	5
4.490	1.669	1.060	4.494	4
4.488	1.480	1.041	4.503	4
4.493	1.299	0.975	4.527	4
4.630	2.069	1.154	4.635	5
4.642	1.861	1.132	4.642	5
4.650	1.680	1.138	4.653	4
4.641	1.483	1.175	4.656	4
4.655	1.306	1.034	4.686	4
4.798	2.057	0.898	4.802	5

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
4.815	1.354	0.991	4.815	4
4.816	1.659	1.011	4.820	4
4.806	1.476	1.037	4.821	4
4.824	1.304	1.104	4.855	4
4.958	2.064	1.001	4.962	5
4.967	1.852	1.037	4.967	4
4.974	1.290	1.084	5.006	4
5.117	2.052	0.917	5.121	5
5.118	1.857	0.913	5.118	4
5.135	1.293	0.992	5.166	4
5.288	2.030	1.051	5.291	5

X-SCAL METERS	Y-SCAL METERS	DENSITY RATIO	R-SCAL METERS	REGN CODE
5.268	1.841	1.136	5.268	4
5.300	1.558	1.045	5.304	4
5.296	1.465	1.067	5.310	4
5.308	1.279	1.142	5.339	4
5.433	2.021	1.165	5.435	5
5.442	1.831	1.082	5.442	4
5.447	1.547	1.123	5.451	4
5.453	1.466	1.035	5.467	4
5.457	1.269	1.152	5.488	4

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DENSITY VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

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TABLE 9.1

PRESSURE FIELD DIPOLE WEST/11 WF5/295 30' SMOKE PUFF GRID 1220 /A730120

AVERAGE HYDROSTATIC OVERPRESSURES AT SCALED TIME= 1.000 MS

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
1.322	2.007	1.507	1.541	2	1.384	0.946	1.353	1.384	1	1.613	1.112	0.523	1.626	1
1.311	1.861	1.607	1.311	5	1.359	0.714	1.520	1.382	1	1.611	0.935	0.453	1.612	1
1.313	1.707	1.599	1.539	1	1.341	0.503	2.139	1.400	1	1.611	0.754	0.544	1.618	1
1.330	1.543	2.521	1.475	1	1.298	0.318	2.411	1.425	1	1.606	0.563	0.550	1.642	1
1.360	1.371	2.761	1.437	1	1.594	1.487	0.118	1.697	1	1.562	0.371	0.327	1.651	1
1.389	1.167	1.957	1.413	1	1.605	1.301	0.384	1.653	1					

AVERAGE HYDROSTATIC OVERPRESSURES AT SCALED TIME= 2.000 MS

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
1.613	1.974	1.404	1.618	5	1.839	1.346	1.541	1.891	1	1.978	0.555	1.339	2.008	1
1.603	1.854	1.659	1.603	4	1.839	1.140	0.885	1.854	1	1.954	0.350	1.089	2.028	1
1.612	1.732	1.330	1.617	4	1.826	0.942	0.313	1.826	1	1.939	0.165	1.896	2.063	1
1.647	1.580	1.172	1.760	1	1.801	0.737	0.444	1.809	1	2.172	2.045	0.124	2.130	5
1.558	1.403	0.773	1.731	1	1.780	0.538	0.292	1.818	1	2.177	1.859	0.125	2.177	5
1.639	1.186	0.423	1.663	1	1.781	0.310	1.164	1.878	1	2.172	1.675	0.097	2.179	4
1.619	0.946	0.322	1.620	1	1.986	2.045	2.573	1.996	5	2.168	1.489	0.143	2.246	1
1.588	0.712	2.288	1.599	1	1.995	1.862	2.481	1.995	5	2.175	1.305	0.260	2.211	1
1.582	0.464	1.310	1.642	1	1.983	1.680	2.421	1.991	4	2.182	1.130	0.331	2.194	1
1.598	0.272	1.017	1.719	1	1.976	1.502	1.735	2.064	1	2.183	0.947	0.393	2.184	1
1.831	2.010	1.714	1.838	5	1.994	1.314	1.453	2.035	1	2.168	0.756	0.406	2.173	1
1.842	1.861	1.204	1.842	5	2.013	1.131	1.166	2.025	1	2.147	0.570	0.293	2.173	1
1.837	1.703	2.556	1.843	4	2.018	0.948	1.427	2.019	1	2.141	0.397	0.205	2.200	1
1.827	1.535	2.037	1.933	1	2.006	0.766	1.282	2.011	1	2.118	0.207	0.211	2.230	1

AVERAGE HYDROSTATIC OVERPRESSURES AT SCALED TIME= 3.000 MS

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
1.759	1.734	0.092	1.763	4	2.177	0.763	1.017	2.182	1	2.514	1.483	2.700	2.540	4
1.803	1.564	0.141	1.919	1	2.163	0.548	1.231	2.192	1	2.499	1.315	2.177	2.533	1
1.836	1.376	0.239	1.895	1	2.162	0.357	0.855	2.231	1	2.500	1.139	1.169	2.511	1
1.840	1.163	0.443	1.858	1	2.173	0.177	1.025	2.292	1	2.494	0.953	1.017	2.494	1
1.833	0.937	0.301	1.833	1	2.414	2.078	1.046	2.425	5	2.481	0.760	0.959	2.486	1
2.076	1.711	0.389	2.081	4	2.425	1.865	1.985	2.425	5	2.476	0.587	1.056	2.496	1
2.029	1.527	0.601	2.123	1	2.403	1.652	0.958	2.411	4	2.457	0.402	0.935	2.508	1
2.036	1.324	0.850	2.079	1	2.381	1.486	1.144	2.409	4	2.454	0.210	1.783	2.463	3
2.034	1.125	1.050	2.046	1	2.365	1.312	1.545	2.399	1	2.724	2.069	0.100	2.733	5
2.024	0.943	0.575	2.025	1	2.353	1.144	0.779	2.365	1	2.718	1.877	0.141	2.713	5
1.990	0.333	0.721	2.071	1	2.339	0.950	0.623	2.339	1	2.703	1.693	0.107	2.707	4
2.278	2.074	1.536	2.289	5	2.319	0.748	0.540	2.324	1	2.704	1.508	0.062	2.726	4
2.324	1.872	1.378	2.324	5	2.300	0.559	0.691	2.326	1	2.698	1.332	0.046	2.747	4
2.264	1.670	1.344	2.271	4	2.309	0.380	0.922	2.368	1	2.698	1.150	0.058	2.709	1
2.212	1.494	0.828	2.289	1	2.311	0.187	1.281	2.318	3	2.688	0.958	0.119	2.689	1
2.213	1.313	0.686	2.250	1	2.540	2.075	2.373	2.550	5	2.680	0.781	0.117	2.683	1
2.205	1.134	0.854	2.215	1	2.535	1.879	1.920	2.535	5	2.673	0.600	0.110	2.690	1
2.198	0.953	1.173	2.199	1	2.532	1.683	2.482	2.538	4	2.666	0.414	0.069	2.711	1

X AND Y LOCATE THE CENTER OF A PLANE QUADRILATERAL WHICH IS A CELL OF 4 NEIGHBOURING SMOKE PUFFS.
OVERPRESSURE IS AVERAGED OVER THE AREA OF THE CELL AND IS EXPRESSED AS A RATIO TO THE AMBIENT PRESSURE.

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
PRESSURE VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 9.2

PRESSURE FIELD   DIPOLE WEST/11   WF5/295   30'   SMOKE PUFF GRID 1220   /A780120

AVERAGE HYDROSTATIC OVERPRESSURES AT SCALED TIME= 4.000 MS

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
1.852	1.777	0.450	1.853	4	2.500	0.740	0.683	2.505	1	3.039	2.060	1.137	3.046	5
1.892	1.616	0.107	2.021	1	2.467	0.560	0.783	2.491	1	3.037	1.852	0.942	3.037	4
1.938	1.417	-0.092	2.004	1	2.471	0.385	0.954	2.525	1	3.035	1.572	1.121	3.040	4
1.950	1.182	-0.236	1.970	1	2.779	2.096	0.702	2.790	5	3.013	1.492	0.938	3.034	4
2.184	1.734	0.037	2.191	4	2.774	1.880	0.375	2.774	5	3.008	1.309	1.000	3.055	4
2.130	1.553	0.213	2.227	1	2.774	1.663	0.618	2.780	4	2.986	1.126	0.915	2.995	1
2.169	1.334	0.340	2.211	1	2.682	1.122	0.827	2.691	1	2.962	0.951	0.505	2.962	1
2.193	1.123	0.421	2.204	1	2.666	0.936	1.218	2.666	1	2.950	0.767	0.369	2.953	1
2.112	0.319	0.392	2.191	1	2.648	0.754	1.133	2.653	1	2.955	0.591	0.575	2.972	1
2.419	2.065	0.393	2.430	5	2.641	0.578	0.842	2.661	1	2.951	0.401	0.690	2.978	3
2.501	1.876	0.714	2.501	5	2.633	0.398	0.346	2.682	1	3.173	2.037	0.341	3.183	5
2.366	1.298	0.291	2.398	1	2.916	2.093	1.333	2.926	5	3.179	1.655	0.354	3.179	4
2.380	1.112	0.591	2.339	1	2.917	1.875	1.575	2.917	5	3.175	1.669	0.322	3.180	4
2.392	0.937	1.188	2.392	1	2.906	1.681	1.795	2.911	4	3.161	1.437	0.263	3.182	4
2.372	0.759	1.040	2.376	1	2.886	1.478	1.765	2.910	4	3.152	1.293	0.234	3.202	4
2.327	0.543	0.805	2.355	1	2.862	1.301	1.109	2.914	4	3.139	1.119	0.189	3.223	4
2.312	0.361	0.334	2.375	1	2.838	1.133	1.011	2.847	1	3.132	0.945	0.166	3.132	1
2.608	2.102	0.011	2.620	5	2.811	0.950	1.370	2.812	1	3.127	0.768	0.131	3.130	1
2.522	1.870	0.552	2.622	5	2.793	0.771	1.078	2.796	1	3.128	0.577	0.141	3.145	1
2.538	1.128	0.288	2.548	1	2.796	0.592	1.153	2.814	1	3.121	0.390	0.113	3.145	3
2.523	0.932	0.950	2.523	1	2.806	0.406	1.116	2.850	1	3.117	0.200	0.122	3.123	3

AVERAGE HYDROSTATIC OVERPRESSURES AT SCALED TIME= 5.000 MS

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
2.488	2.078	0.596	2.499	5	3.015	1.287	0.253	3.067	4	3.258	0.755	0.847	3.261	1
2.596	1.882	0.336	2.598	5	2.998	1.120	0.614	3.006	1	3.261	0.576	1.024	3.311	3
2.442	1.326	0.074	2.478	1	2.986	0.938	1.178	2.986	1	3.256	0.384	0.850	3.279	3
2.469	1.131	0.030	2.480	1	2.969	0.748	1.375	2.973	1	3.470	2.049	0.966	3.476	5
2.492	0.939	0.314	2.492	1	2.968	0.579	0.844	2.986	1	3.468	1.861	0.960	3.463	5
2.472	0.743	0.199	2.477	1	2.966	0.401	0.622	2.993	3	3.451	1.668	1.663	3.466	4
2.698	2.111	-0.244	2.711	5	3.226	2.077	0.262	3.234	5	3.448	1.470	1.475	3.469	4
2.729	1.866	0.519	2.729	5	3.221	1.849	0.185	3.221	4	3.433	1.273	1.180	3.481	4
2.655	0.930	0.210	2.655	1	3.217	1.660	0.578	3.222	4	3.415	1.087	1.032	3.500	4
2.628	0.728	0.152	2.634	1	3.194	1.473	0.726	3.217	4	3.392	0.923	0.802	3.517	4
2.579	0.527	0.031	2.607	1	3.192	1.279	0.730	3.243	4	3.386	0.754	0.955	3.389	1
2.578	0.360	0.514	2.635	1	3.159	1.108	0.795	3.246	4	3.374	0.573	1.092	3.422	3
2.899	2.106	0.245	2.910	5	3.124	0.931	0.578	3.124	1	3.374	0.386	1.072	3.396	3
2.890	1.883	0.002	2.890	5	3.114	0.755	0.503	3.117	1	3.574	2.043	1.563	3.579	5
2.899	1.658	0.260	2.906	4	3.127	0.582	0.724	3.143	1	3.571	1.848	1.090	3.571	4
2.831	0.925	0.374	2.831	1	3.117	0.395	0.610	3.142	3	3.556	1.657	1.019	3.562	4
2.811	0.736	0.428	2.816	1	3.357	2.054	0.877	3.363	5	3.547	1.467	0.846	3.568	4
2.785	0.561	0.303	2.806	1	3.357	1.862	0.792	3.357	5	3.544	1.291	0.642	3.588	4
2.774	0.380	0.144	2.799	3	3.352	1.659	0.475	3.357	4	3.542	1.116	0.699	3.618	4
3.068	2.106	0.339	3.078	5	3.332	1.476	0.326	3.353	4	3.530	0.925	0.431	3.649	4
3.068	1.872	0.410	3.068	5	3.320	1.271	0.534	3.371	4	3.519	0.747	0.342	3.598	3
3.055	1.669	0.649	3.061	4	3.290	1.092	0.781	3.377	4	3.509	0.557	0.271	3.555	3
3.043	1.459	0.478	3.068	4	3.263	0.926	1.013	3.263	1	3.506	0.385	0.318	3.527	3

X AND Y LOCATE THE CENTER OF A PLANE QUADRILATERAL WHICH IS A CELL OF 4 NEIGHBOURING SMOKE PUFFS.
OVERPRESSURE IS AVERAGED OVER THE AREA OF THE CELL AND IS EXPRESSED AS A RATIO TO THE AMBIENT PRESSURE.

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
PRESSURE VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 9.3

PRESSURE FIELD   DIPOLE WEST/11   WF5/295 30°   SMOKE PUFF GRID 1220   /A780120

AVERAGE HYDROSTATIC OVERPRESSURES AT SCALED TIME= 6.000 MS

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
2.971	2.113	0.133	2.983	5	3.468	1.653	0.194	3.473	4	3.850	1.842	0.754	3.850	4
2.966	1.890	-0.137	2.956	5	3.454	1.467	0.096	3.475	4	3.841	1.647	1.022	3.846	4
2.982	1.669	0.072	2.988	4	3.452	1.261	0.148	3.502	4	3.832	1.457	0.556	3.853	4
2.911	0.927	-0.005	2.911	1	3.430	1.083	0.466	3.515	4	3.822	1.288	0.441	3.863	4
2.892	0.729	0.056	2.898	1	3.406	0.917	0.693	3.532	4	3.803	1.101	0.761	3.870	4
2.868	0.541	0.048	2.891	1	3.407	0.738	0.364	3.411	1	3.790	0.913	0.815	3.904	4
2.856	0.353	0.080	2.888	3	3.408	0.559	0.496	3.454	3	3.781	0.734	1.017	3.852	3
3.148	2.113	0.185	3.159	5	3.398	0.368	0.635	3.418	3	3.773	0.567	0.990	3.816	3
3.133	1.876	0.373	3.153	5	3.608	2.056	0.322	3.614	5	3.760	0.382	0.586	3.779	3
3.147	1.676	0.622	3.152	4	3.602	1.862	0.203	3.602	5	3.970	2.025	0.997	3.973	5
3.140	1.467	0.314	3.163	4	3.592	1.660	0.879	3.597	4	3.965	1.820	0.851	3.965	4
3.114	1.302	0.033	3.162	4	3.583	1.459	0.938	3.604	4	3.951	1.639	0.931	3.967	4
3.096	1.128	0.198	3.180	4	3.578	1.255	0.794	3.627	4	3.954	1.451	0.951	3.974	4
3.089	0.938	0.536	3.089	1	3.572	1.065	0.564	3.657	4	3.945	1.265	0.971	3.989	4
3.074	0.736	0.723	3.079	1	3.553	0.905	0.347	3.677	4	3.931	1.095	1.038	4.003	4
3.073	0.562	0.203	3.092	1	3.550	0.741	0.565	3.627	3	3.911	0.909	0.821	4.023	4
3.072	0.379	0.246	3.095	3	3.531	0.554	0.997	3.574	3	3.903	0.731	0.821	3.970	3
3.319	2.084	-0.001	3.328	5	3.524	0.374	0.938	3.544	3	3.893	0.546	0.712	3.931	3
3.316	1.651	-0.023	3.316	4	3.734	2.056	0.702	3.740	5	3.891	0.362	0.739	3.907	3
3.317	1.659	0.245	3.323	4	3.731	1.850	0.343	3.731	4	4.100	2.020	0.271	4.104	5
3.302	1.475	0.500	3.324	4	3.715	1.646	0.175	3.721	4	4.101	1.831	0.245	4.101	4
3.309	1.277	0.431	3.359	4	3.701	1.457	0.215	3.722	4	4.094	1.635	0.279	4.099	4
3.280	1.106	0.355	3.363	4	3.693	1.271	0.401	3.738	4	4.084	1.445	0.236	4.105	4
3.250	0.924	0.117	3.250	1	3.695	1.094	1.074	3.772	4	4.085	1.271	0.117	4.126	4
3.242	0.744	0.169	3.246	1	3.686	0.903	1.499	3.807	4	4.077	1.092	0.061	4.147	4
3.257	0.564	0.312	3.306	3	3.672	0.725	0.946	3.743	3	4.062	0.914	0.027	4.169	4
3.243	0.375	0.393	3.264	3	3.650	0.554	0.819	3.691	3	4.052	0.355	0.035	4.063	3
3.473	2.066	0.250	3.430	5	3.636	0.381	1.097	3.656	3					
3.467	1.861	0.367	3.467	5	3.848	2.043	0.721	3.853	5					

X AND Y LOCATE THE CENTER OF A PLANE QUADRILATERAL WHICH IS A CELL OF 4 NEIGHBOURING SMOKE PUFFS.
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PRESSURE VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

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TABLE 9.4

PRESSURE FIELD   DIPOLE WEST/11   WF5/295   30'   SMOKE PUFF GRID 1220   /A780120

AVERAGE HYDROSTATIC OVERPRESSURES AT SCALED TIME= 7.000 MS

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
3.036	2.131	0.119	3.049	5	3.506	0.543	0.251	3.546	3	4.086	1.083	0.970	4.157	4
3.037	1.911	-0.150	3.039	5	3.505	0.355	0.407	3.523	3	4.070	0.895	0.655	4.181	4
3.054	1.667	0.062	3.058	4	3.693	2.064	0.157	3.700	5	4.060	0.718	0.770	4.123	3
2.953	0.935	-0.072	2.953	1	3.690	1.871	0.057	3.690	5	4.045	0.529	0.454	4.079	3
2.935	0.738	-0.036	2.942	1	3.685	1.658	0.038	3.689	4	4.226	2.024	0.599	4.232	5
2.912	0.553	0.122	2.933	1	3.681	1.466	0.604	3.701	4	4.225	1.834	0.519	4.226	4
2.916	0.372	0.001	2.940	3	3.683	1.258	0.501	3.730	4	4.213	1.625	0.709	4.224	4
3.216	2.129	0.125	3.228	5	3.680	1.064	0.236	3.763	4	4.203	1.437	0.576	4.228	4
3.225	1.893	0.308	3.225	5	3.662	0.899	-0.013	3.784	4	4.202	1.257	0.527	4.244	4
3.221	1.693	0.437	3.224	4	3.662	0.729	0.073	3.734	3	4.204	1.074	0.502	4.275	4
3.202	1.482	0.167	3.224	4	3.644	0.540	0.508	3.684	3	4.197	0.894	0.579	4.305	4
3.171	1.318	-0.095	3.215	4	3.644	0.361	0.633	3.662	3	4.184	0.708	0.673	4.244	3
3.149	1.142	0.001	3.227	4	3.828	2.063	0.417	3.834	5	4.170	0.524	0.570	4.203	3
3.140	0.949	0.295	3.140	1	3.828	1.854	0.192	3.828	4	4.348	2.025	1.072	4.351	5
3.128	0.739	0.477	3.132	1	3.816	1.650	0.035	3.822	4	4.348	1.825	0.931	4.348	4
3.131	0.565	0.061	3.132	3	3.808	1.459	0.043	3.828	4	4.342	1.642	1.003	4.347	4
3.133	0.379	-0.093	3.156	3	3.808	1.272	0.160	3.851	4	4.329	1.448	0.966	4.347	4
3.391	2.097	-0.033	3.400	5	3.817	1.089	0.585	3.893	4	4.326	1.270	0.725	4.365	4
3.391	1.867	-0.059	3.391	5	3.816	0.899	0.936	3.933	4	4.322	1.090	0.930	4.389	4
3.397	1.673	0.129	3.401	4	3.807	0.709	0.449	3.872	3	4.310	0.906	1.052	4.412	4
3.382	1.487	0.229	3.402	4	3.785	0.537	0.327	3.823	3	4.306	0.722	1.225	4.366	3
3.390	1.290	0.115	3.436	4	3.955	2.047	0.348	3.960	5	4.303	0.540	1.121	4.337	3
3.355	1.116	0.022	3.434	4	3.959	1.843	0.398	3.959	4	4.288	0.348	0.900	4.302	3
3.319	0.931	-0.148	3.319	1	3.954	1.646	0.561	3.959	4	4.490	2.016	0.236	4.493	5
3.315	0.741	-0.123	3.319	1	3.957	1.456	0.189	3.976	4	4.493	1.823	0.240	4.494	4
3.338	0.555	-0.025	3.384	3	3.954	1.285	0.081	3.994	4	4.486	1.632	0.204	4.491	4
3.329	0.364	0.191	3.349	3	3.946	1.097	0.221	4.018	4	4.475	1.453	0.189	4.493	4
3.550	2.078	0.107	3.558	5	3.937	0.906	0.290	4.049	4	4.473	1.277	0.231	4.510	4
3.546	1.873	0.255	3.546	5	3.930	0.722	0.495	3.995	3	4.465	1.091	0.279	4.530	4
3.553	1.667	0.086	3.558	4	3.924	0.549	0.674	3.963	3	4.450	0.906	0.210	4.549	4
3.545	1.478	-0.004	3.565	4	4.099	2.031	0.325	4.103	5	4.441	0.736	0.193	4.501	3
3.548	1.267	-0.020	3.596	4	4.095	1.821	0.289	4.095	4	4.443	0.543	0.145	4.476	3
3.524	1.087	0.247	3.606	4	4.094	1.635	0.493	4.100	4	4.439	0.350	0.036	4.453	3
3.495	0.916	0.364	3.618	4	4.089	1.448	0.834	4.109	4					
3.499	0.731	0.138	3.574	3	4.088	1.258	0.984	4.131	4					

X AND Y LOCATE THE CENTER OF A PLANE QUADRILATERAL WHICH IS A CELL OF 4 NEIGHBOURING SMOKE PUFFS.
OVERPRESSURE IS AVERAGED OVER THE AREA OF THE CELL AND IS EXPRESSED AS A RATIO TO THE AMBIENT PRESSURE.

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
PRESSURE VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 9.5

PRESSURE FIELD   DIPOLE WEST/11   WF5/295   30°   SMOKE PUFF GRID 1220   /A730120

AVERAGE HYDROSTATIC OVERPRESSURES AT SCALED TIME= 8.000 MS

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
3.271	2.153	0.102	3.284	5	3.707	0.547	0.289	3.747	3	4.447	2.028	0.663	4.451	5
3.277	1.912	0.290	3.277	5	3.722	0.371	0.417	3.741	3	4.457	1.824	0.534	4.457	4
3.269	1.703	0.322	3.272	4	3.894	2.074	0.305	3.900	5	4.453	1.646	0.545	4.463	4
3.242	1.487	-0.004	3.263	4	3.897	1.870	0.097	3.897	5	4.445	1.448	0.637	4.464	4
3.197	1.326	-0.149	3.239	4	3.891	1.666	-0.029	3.895	4	4.449	1.259	0.392	4.487	4
3.178	1.151	0.108	3.254	4	3.883	1.472	-0.097	3.901	4	4.451	1.088	0.519	4.516	4
3.172	0.964	0.578	3.173	1	3.883	1.279	0.017	3.925	4	4.443	0.904	0.518	4.542	4
3.160	0.757	0.753	3.164	1	3.891	1.092	0.334	3.965	4	4.442	0.723	0.547	4.501	3
3.167	0.598	0.188	3.182	1	3.886	0.898	0.740	4.002	4	4.439	0.531	0.459	4.471	3
3.165	0.410	-0.249	3.191	3	3.877	0.712	0.298	3.942	3	4.422	0.345	0.838	4.435	3
3.447	2.116	-0.095	3.457	5	3.862	0.542	0.194	3.900	3	4.589	2.018	0.296	4.592	5
3.446	1.886	-0.160	3.446	5	4.027	2.057	0.268	4.033	5	4.601	1.824	0.435	4.601	4
3.453	1.691	-0.030	3.457	4	4.034	1.855	0.284	4.034	4	4.597	1.627	0.453	4.603	4
3.439	1.499	0.054	3.457	4	4.034	1.657	0.399	4.039	4	4.584	1.444	0.482	4.602	4
3.437	1.299	-0.162	3.481	4	4.040	1.464	0.029	4.058	4	4.583	1.270	0.695	4.625	4
3.389	1.127	-0.157	3.466	4	4.042	1.292	-0.099	4.080	4	4.581	1.039	0.937	4.644	4
3.348	0.940	-0.202	3.348	1	4.035	1.101	-0.062	4.104	4	4.571	0.906	0.879	4.658	4
3.351	0.757	-0.157	3.354	1	4.025	0.907	-0.026	4.134	4	4.565	0.730	0.626	4.623	3
3.380	0.577	-0.045	3.429	3	4.017	0.721	0.142	4.081	3	4.563	0.530	0.639	4.593	3
3.370	0.389	-0.003	3.393	3	4.018	0.542	0.196	4.054	3	4.557	0.350	1.236	4.570	3
3.610	2.095	0.066	3.619	5	4.180	2.040	0.183	4.184	5	4.720	2.027	0.535	4.723	5
3.611	1.891	0.131	3.611	5	4.176	1.828	0.192	4.176	4	4.725	1.823	0.557	4.725	4
3.620	1.685	-0.054	3.623	4	4.182	1.642	0.303	4.187	4	4.723	1.621	0.407	4.729	4
3.612	1.492	-0.101	3.630	4	4.184	1.453	0.548	4.203	4	4.708	1.442	0.675	4.725	4
3.611	1.277	-0.117	3.657	4	4.190	1.263	0.702	4.232	4	4.706	1.263	0.765	4.743	4
3.573	1.093	0.096	3.653	4	4.193	1.088	0.651	4.262	4	4.706	1.091	0.654	4.767	4
3.536	0.923	0.208	3.656	4	4.179	0.899	0.281	4.287	4	4.698	0.906	0.545	4.792	4
3.542	0.739	0.099	3.619	3	4.166	0.712	0.314	4.226	3	4.693	0.728	0.424	4.749	3
3.558	0.554	0.265	3.601	3	4.156	0.518	0.237	4.183	3	4.685	0.541	0.709	4.717	3
3.564	0.366	0.076	3.583	3	4.316	2.027	0.354	4.319	5	4.669	0.345	1.040	4.681	3
3.756	2.081	0.159	3.763	5	4.318	1.838	0.297	4.318	4	4.846	2.016	0.475	4.848	5
3.757	1.889	0.073	3.757	5	4.317	1.630	0.429	4.323	4	4.844	1.829	0.485	4.844	4
3.756	1.687	0.577	3.760	4	4.314	1.442	0.356	4.333	4	4.855	1.632	0.365	4.860	4
3.752	1.481	0.417	3.770	4	4.313	1.260	0.342	4.354	4	4.843	1.449	0.550	4.860	4
3.751	1.265	0.348	3.797	4	4.322	1.078	0.657	4.390	4	4.832	1.270	0.551	4.867	4
3.741	1.067	0.020	3.822	4	4.317	0.894	0.351	4.422	4	4.839	1.091	0.486	4.898	4
3.716	0.901	-0.159	3.836	4	4.303	0.704	0.443	4.360	3	4.836	0.906	0.359	4.927	4
3.718	0.731	-0.063	3.790	3	4.293	0.516	0.253	4.324	3	4.831	0.721	0.477	4.885	3

X AND Y LOCATE THE CENTER OF A PLANE QUADRILATERAL WHICH IS A CELL OF 4 NEIGHBOURING SMOKE PUFFS.
OVERPRESSURE IS AVERAGED OVER THE AREA OF THE CELL AND IS EXPRESSED AS A RATIO TO THE AMBIENT PRESSURE.

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
PRESSURE VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 9.6

PRESSURE FIELD   DIPOLE WEST/11   WF5/295 30'   SMOKE PUFF GRID 1220   /A780120

AVERAGE HYDROSTATIC OVERPRESSURES AT SCALED TIME= 9.000 MS

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
3.479	2.133	-0.198	3.490	5	4.092	1.870	0.205	4.092	5	4.634	1.634	0.242	4.689	4
3.479	1.897	-0.234	3.479	5	4.092	1.670	0.336	4.096	4	4.674	1.450	0.237	4.691	4
3.486	1.693	-0.140	3.490	4	4.094	1.472	-0.064	4.111	4	4.665	1.274	0.387	4.720	4
3.476	1.499	0.164	3.494	4	4.094	1.298	-0.174	4.131	4	4.633	1.084	0.455	4.745	4
3.477	1.297	0.081	3.521	4	4.090	1.101	-0.193	4.158	4	4.670	0.342	1.235	4.582	3
3.426	1.139	-0.041	3.499	4	4.083	0.910	-0.146	4.190	4	4.807	2.031	0.294	4.810	5
3.373	0.951	-0.212	3.491	4	4.072	0.726	0.024	4.135	3	4.817	1.826	0.467	4.817	4
3.374	0.779	-0.173	3.376	1	4.079	0.555	0.111	4.116	3	4.820	1.622	0.290	4.825	4
3.410	0.598	0.058	3.462	3	4.240	2.054	0.124	4.245	5	4.808	1.443	0.533	4.825	4
3.651	2.113	-0.050	3.660	5	4.238	1.841	0.080	4.238	4	4.816	1.263	0.411	4.852	4
3.651	1.903	-0.020	3.651	5	4.245	1.653	0.155	4.249	4	4.823	1.090	0.319	4.833	4
3.656	1.688	-0.153	3.660	4	4.246	1.451	0.326	4.264	4	4.793	0.334	0.765	4.804	3
3.646	1.491	-0.139	3.664	4	4.251	1.267	0.413	4.291	4	4.947	2.017	0.175	4.950	5
3.642	1.277	-0.164	3.687	4	4.259	1.091	0.502	4.327	4	4.947	1.827	0.224	4.947	4
3.601	1.098	0.083	3.679	4	4.248	0.897	0.211	4.354	4	4.957	1.628	0.218	4.962	4
3.567	0.937	0.208	3.683	4	4.236	0.716	0.243	4.296	3	4.949	1.443	0.462	4.956	4
3.575	0.758	-0.008	3.655	3	4.230	0.529	-0.013	4.263	3	4.953	1.269	0.423	4.987	4
3.589	0.580	0.189	3.636	3	4.381	2.039	0.253	4.385	5	4.959	1.090	0.549	5.017	4
3.300	2.099	0.103	3.808	5	4.386	1.848	0.203	4.386	4	4.953	0.900	0.459	5.044	4
3.799	1.899	0.003	3.800	5	4.388	1.639	0.250	4.394	4	4.946	0.708	0.593	4.996	3
3.798	1.692	0.335	3.801	4	4.384	1.448	0.193	4.403	4	5.094	1.997	0.441	5.096	5
3.790	1.482	0.295	3.608	4	4.395	1.264	0.151	4.425	4	5.092	1.811	0.597	5.092	4
3.738	1.266	0.276	3.833	4	4.398	1.079	0.337	4.465	4	5.098	1.634	0.517	5.102	4
3.776	1.072	0.003	3.856	4	4.393	0.890	0.098	4.497	4	5.090	1.446	0.553	5.106	4
3.756	0.913	-0.122	3.871	4	4.382	0.707	0.492	4.439	3	5.094	1.261	0.711	5.128	4
3.763	0.751	-0.131	3.838	3	4.378	0.519	0.146	4.409	3	5.090	1.061	0.671	5.148	4
3.752	0.570	0.080	3.795	3	4.516	2.035	0.607	4.519	5	5.086	0.904	0.505	5.173	4
3.768	0.391	0.195	3.789	3	4.530	1.833	0.462	4.530	4	5.079	0.724	0.589	5.130	3
3.944	2.088	0.122	3.951	5	4.535	1.654	0.422	4.539	4	5.222	1.995	0.575	5.224	5
3.947	1.884	-0.060	3.947	5	4.525	1.453	0.439	4.542	4	5.223	1.805	0.491	5.224	4
3.942	1.675	-0.162	3.945	4	4.533	1.273	0.205	4.569	4	5.225	1.626	0.610	5.230	4
3.929	1.478	-0.217	3.947	4	4.537	1.090	0.302	4.601	4	5.223	1.450	0.505	5.238	4
3.926	1.283	-0.082	3.967	4	4.529	0.899	0.330	4.628	4	5.220	1.258	0.612	5.254	4
3.934	1.095	0.153	4.006	4	4.526	0.716	0.558	4.582	3	5.217	1.072	0.523	5.275	4
3.933	0.905	0.517	4.046	4	4.532	0.527	0.317	4.563	3	5.218	0.909	0.600	5.302	4
3.928	0.724	0.390	3.994	3	4.527	0.349	0.934	4.541	3	5.211	0.728	0.635	5.262	3
3.914	0.556	0.185	3.953	3	4.665	2.023	0.131	4.668	5	5.191	0.540	0.595	5.219	3
4.084	2.072	0.232	4.090	5	4.683	1.828	0.288	4.683	4	5.181	0.350	0.575	5.193	3

X AND Y LOCATE THE CENTER OF A PLANE QUADRILATERAL WHICH IS A CELL OF 4 NEIGHBOURING SMOKE PUFFS.
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OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
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PRESSURE VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 9.7

PRESSURE FIELD   DIPOLE WEST/11   WF5/295   30'   SMOKE PUFF GRID 1220   /A780120

AVERAGE HYDROSTATIC OVERPRESSURES AT SCALED TIME= 10.000 MS

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
3.670	2.123	-0.172	3.680	5	4.286	2.068	0.034	4.292	5	4.873	2.043	0.222	4.877	5
3.668	1.906	-0.102	3.668	5	4.283	1.851	-0.026	4.283	4	4.886	1.837	0.357	4.886	4
3.675	1.687	-0.154	3.679	4	4.286	1.659	0.036	4.291	4	4.892	1.630	0.112	4.897	4
3.669	1.488	-0.148	3.687	4	4.284	1.466	0.246	4.302	4	4.881	1.450	0.296	4.897	4
3.669	1.280	-0.175	3.714	4	4.289	1.272	0.322	4.328	4	4.891	1.265	0.219	4.926	4
3.826	2.110	-0.015	3.835	5	4.434	2.054	0.125	4.438	5	5.020	2.029	0.041	5.024	5
3.820	1.900	-0.087	3.821	5	4.437	1.859	0.071	4.438	5	5.023	1.837	0.087	5.023	4
3.818	1.689	0.274	3.822	4	4.438	1.646	0.097	4.443	4	5.039	1.638	0.075	5.043	4
3.815	1.480	0.333	3.833	4	4.431	1.454	0.061	4.449	4	5.034	1.450	0.248	5.050	4
3.819	1.269	0.261	3.863	4	4.430	1.269	0.040	4.468	4	5.040	1.272	0.132	5.073	4
3.977	2.101	-0.110	3.985	5	4.574	2.050	0.430	4.579	5	5.175	2.005	0.270	5.178	5
3.977	1.888	-0.190	3.977	5	4.588	1.845	0.331	4.588	4	5.177	1.819	0.469	5.177	4
3.968	1.675	-0.257	3.972	4	4.592	1.663	0.303	4.596	4	5.190	1.641	0.325	5.194	4
3.958	1.479	-0.219	3.976	4	4.579	1.459	0.296	4.596	4	5.187	1.452	0.327	5.203	4
3.959	1.288	-0.089	3.999	4	4.586	1.276	0.092	4.622	4	5.194	1.264	0.446	5.228	4
4.124	2.087	0.086	4.131	5	4.728	2.038	0.056	4.731	5	5.311	1.998	0.392	5.313	5
4.130	1.878	0.078	4.130	5	4.747	1.840	0.192	4.747	4	5.318	1.809	0.319	5.318	4
4.126	1.674	0.224	4.130	4	4.748	1.644	0.110	4.752	4	5.324	1.629	0.442	5.329	4
4.127	1.476	-0.104	4.144	4	4.736	1.455	0.075	4.753	4	5.328	1.452	0.392	5.343	4
4.128	1.303	-0.183	4.164	4	4.749	1.277	0.197	4.783	4	5.327	1.257	0.475	5.360	4

AVERAGE HYDROSTATIC OVERPRESSURES AT SCALED TIME= 11.000 MS

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE	X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
4.142	2.096	-0.068	4.150	5	4.613	2.062	0.306	4.618	5	5.078	2.043	-0.024	5.081	5
4.149	1.883	-0.028	4.149	5	4.625	1.853	0.207	4.625	4	5.080	1.850	-0.033	5.080	4
4.147	1.679	0.187	4.150	4	4.629	1.670	0.224	4.632	4	5.092	1.646	-0.079	5.096	4
4.152	1.485	-0.076	4.168	4	4.614	1.467	0.255	4.630	4	5.087	1.458	0.035	5.102	4
4.159	1.317	-0.180	4.193	4	4.622	1.287	0.068	4.657	4	5.095	1.277	0.003	5.127	4
4.314	2.077	-0.081	4.320	5	4.774	2.051	-0.050	4.778	5	5.241	2.019	0.174	5.244	5
4.306	1.855	-0.051	4.306	4	4.792	1.849	0.070	4.792	4	5.243	1.831	0.300	5.243	4
4.310	1.662	-0.018	4.314	4	4.790	1.650	0.021	4.794	4	5.255	1.650	0.160	5.259	4
4.312	1.473	0.263	4.329	4	4.777	1.461	0.028	4.793	4	5.252	1.458	0.171	5.266	4
4.322	1.286	0.391	4.359	4	4.791	1.286	0.145	4.824	4	5.250	1.267	0.270	5.292	4
4.466	2.062	0.015	4.471	5	4.926	2.057	0.120	4.930	5	5.380	2.010	0.344	5.383	5
4.467	1.865	-0.029	4.467	5	4.937	1.848	0.231	4.937	4	5.390	1.821	0.210	5.391	4
4.468	1.653	0.035	4.472	4	4.938	1.638	0.051	4.942	4	5.398	1.639	0.268	5.402	4
4.462	1.462	0.038	4.479	4	4.924	1.455	0.269	4.940	4	5.402	1.459	0.197	5.417	4
4.464	1.280	0.041	4.500	4	4.939	1.273	0.170	4.973	4	5.402	1.260	0.283	5.435	4

X AND Y LOCATE THE CENTER OF A PLANE QUADRILATERAL WHICH IS A CELL OF 4 NEIGHBOURING SMOKE PUFFS.
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OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
PRESSURE VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

TABLE 9.8

PRESSURE FIELD   DIPOLE WEST/11   WF5/295   30'   SMOKE PUFF GRID 1220   /A760120

AVERAGE HYDROSTATIC OVERPRESSURES AT SCALED TIME= 12.000 MS

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
4.478	2.059	-0.006	4.434	5
4.483	1.876	0.009	4.483	5
4.490	1.569	0.074	4.494	4
4.488	1.460	0.066	4.503	4
4.493	1.299	-0.028	4.527	4
4.530	2.069	0.229	4.635	5
4.642	1.961	0.197	4.642	5
4.650	1.630	0.206	4.653	4
4.541	1.453	0.261	4.656	4
4.655	1.305	0.056	4.686	4
4.798	2.057	-0.136	4.802	5

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
4.815	1.854	-0.007	4.815	4
4.816	1.659	0.022	4.820	4
4.806	1.475	0.053	4.821	4
4.824	1.304	0.155	4.855	4
4.953	2.064	0.006	4.962	5
4.967	1.852	0.130	4.967	4
4.974	1.290	0.126	5.006	4
5.117	2.052	-0.111	5.121	5
5.118	1.857	-0.115	5.118	4
5.135	1.293	-0.007	5.166	4
5.288	2.030	0.075	5.291	5

X-SCAL METERS	Y-SCAL METERS	PRESSURE RATIO	R-SCAL METERS	REGN CODE
5.288	1.841	0.200	5.288	4
5.300	1.658	0.068	5.304	4
5.296	1.465	0.100	5.310	4
5.308	1.279	0.210	5.339	4
5.433	2.021	0.242	5.436	5
5.442	1.831	0.120	5.442	4
5.447	1.647	0.180	5.451	4
5.453	1.406	0.125	5.467	4
5.457	1.269	0.224	5.488	4

X AND Y LOCATE THE CENTER OF A PLANE QUADRILATERAL WHICH IS A CELL OF 4 NEIGHBOURING SMOKE PUFFS.
OVERPRESSURE IS AVERAGED OVER THE AREA OF THE CELL AND IS EXPRESSED AS A RATIO TO THE AMBIENT PRESSURE.

OBSERVED DISTANCE VALUES= 8.0730 TIMES SCALED VALUES
AND OBSERVED TIME VALUE = 8.5933 TIMES SCALED VALUE.
PRESSURE VALUES AS SHOWN ARE INVARIANT UNDER SCALING.

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